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MODEL AIRPLANE NEWS

FEBRUARY 1956—35 CENTS

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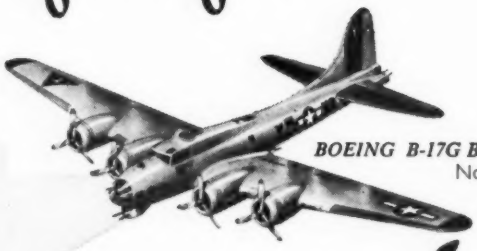

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Our staff of experienced designers, engineers, engravers, and mold makers have but one goal: That is to create the most exacting scale models in easy-to-assemble kits having the ultimate in design and realism. This standard is what continues to make our models your number one choice. The models are designed to satisfy the desires of young and old with kits ranging from eleven to over one hundred and fifty parts. The instruction plans are clear and concise; exploded photographic views make assembly easy. Each kit is packaged in a beautiful full color box that illustrates its truelife action. Releases of future models will continue to incorporate new advanced ideas, keeping THE LINDBERG LINE the forerunner in plastic reproduction.

Paul W. Lindberg
president

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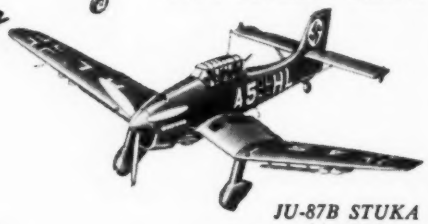

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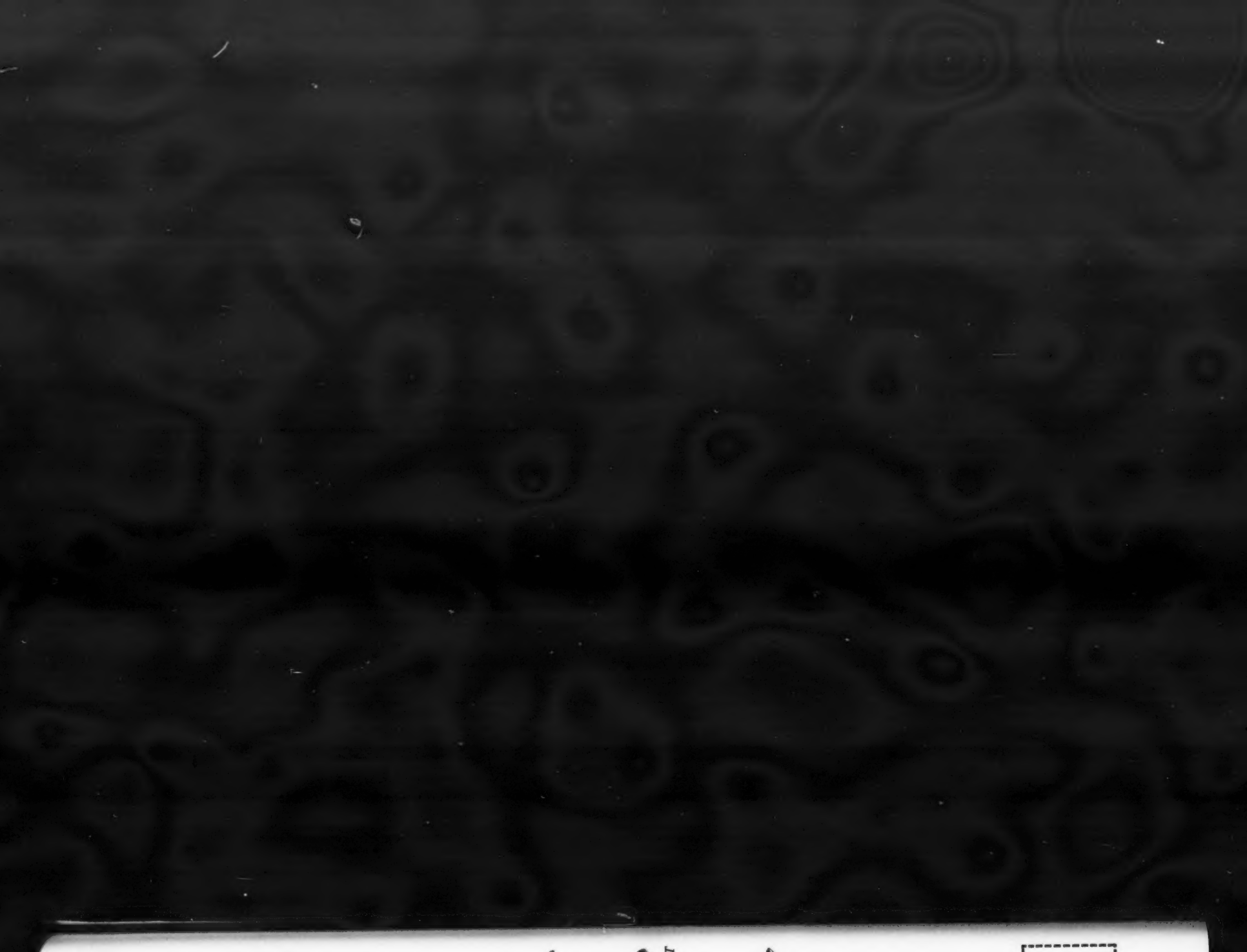

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27th Year of Publication

MODEL AIRPLANE NEWS

JAY P. CLEVELAND, President and Publisher

FEBRUARY 1956 Vol. LIV—No. 2

CONTENTS

CONSTRUCTION

Whippy 9
Stunt Trainer 14
The ABC Robin 20
Blitzen 30

ARTICLES

All Metall (II) 16
Flap Those Wings 19

FEATURES

MAN at Work 2
Trade Show 4
Air Ways 12
Radio Control News 22
Lockheed Masterplans 24
Planes Worth Modeling 32
Foreign Notes 34
Engine Review 36
Contest Calendar 45

WILLIAM WINTER, Editor
WITTICH HOLLOWAY, Art Director

Contributing Editors: Peter Chinn (England), Don Grout, Ed Lorenz, Ted Martin, Bruce Wennerstrom, Harry Williamson

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by William Winter

► Comment about the AMA in club papers leave us a little sad. The AMA belongs to us—we *are* the AMA—so we all have the right to speak our piece. Now we are the first to admit that there are times when we don't know where the NAA began and the AMA left off, but some things we do know.

After an early Nationals, a handful of old timers created the AMA on an idealistic basis, almost without thought as to how it could function and grow. Only the fortunate affiliation with the NAA (for which we hold no brief) made the idea workable. Presently, AMA became the means of writing national rules, holding contests on some standardized basis, recognizing records, setting up committees to consider our problems and performing a host of small services which few members have ever heard about. But it is we—the AMA—not any commercial organization—who do these things. The AMA is the only possible medium through which competitive modeling can be conducted free of special interests. Without the AMA, there would be chaos.

Some people feel AMA should be headed by a director who is a promoter, not a model man. This argument began after Russ Nichols, the former director, moved on. NAA has not been able to replace him. Why we need a promoter baffles us. Modelers and promoters mix like oil and water. How many times have you heard, "Boy, this contest was for the modelers?" When a guy says that, he means that there were no real airplanes, no air shows, no public, no models (of the two-legged variety) to be photographed for publicity. Such things are by-products of promotion. It is to that outer, unwelcome world that modeling has to be sold. Who yells for promotion? Is it, by chance, the few hundred "Internationalists" who really are unhappy about hit-or-miss yearly arrangements on eliminations and trips abroad? Does this group have first call on promotion that, in principle, should further the whole field of airplane modeling?

Why not be truthful? The typical Internationalist is, from the point of view of the beginning modeler, an old man. He probably is married. He has worked for years; is established in (*Continued on page 6*)

NEXT MONTH'S COVER
Travelair

PLANE ON THE COVER

Of the fine Rudy Arnold kodachrome on this month's cover, one could not say it "just happened." But given the task of color-photographing an RC model, Rudy called over the young modeler with the fanciful helmet, Spike Yulke. His dad, Ed, then rounded out the group. Arnold is long famous aviation photographer. The model is one of three MAN X-jobs.

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. . . special for control line flying. Lightweight, oversize fuel tank gives you winning range and power, plus greater output on a power/weight ratio. Mounts flush on the face of your plane. Comes complete with prop, spinner and super-capacity fuel tank.

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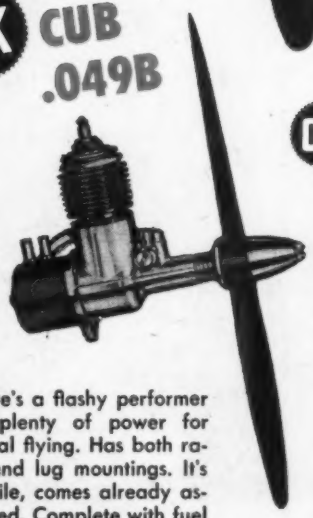

Here's a flashy performer with plenty of power for general flying. Has both radial and lug mountings. It's versatile, comes already assembled. Complete with fuel tank, prop and spinner.

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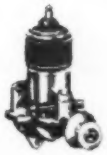

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"OK" CUB .099
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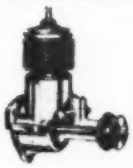

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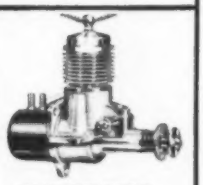

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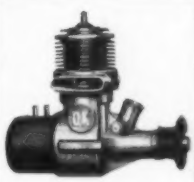

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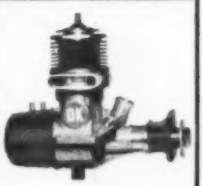

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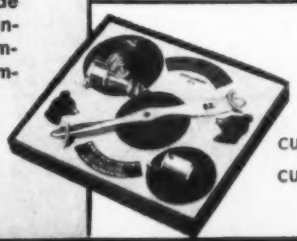

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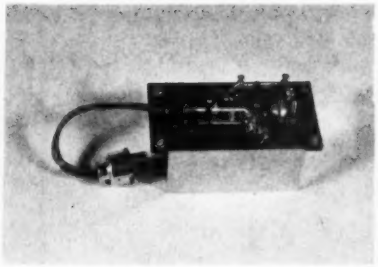
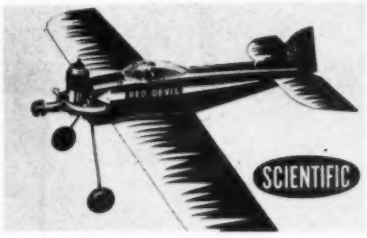
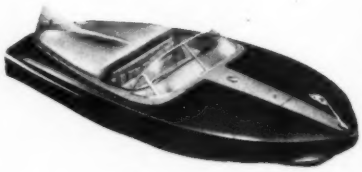
MONTHLY REVIEW OF NEW PRODUCTS, OTHER INTERESTING ITEMS WORTH ATTENTION



► *Receiver:* New, improved R-100 two-tube receiver by Deltron Co., 1940 Conquista Ave., Long Beach, Calif., features .016 gauge aluminum cover to enclose relay. Three inches long, weighs less than two ounces. Box retained by four screws. Mount on foam rubber. Price: $24.95.

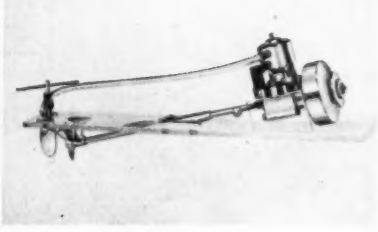


► *Red Devil:* Special two-tone decal layout for the striking flaming color scheme, features Scientific's Half-A Red Devil controlline kit (Scientific Model Airplane Co., 113 Monroe St., Newark 5, N.J.). Spanning 18 inches, takes engines of .035 to .074 capacity. Walker's U-control system. $1.69.



► *Cobra:* The Chris-Craft Cobra by Berkeley Model Supplies, W. Hempstead, N.Y., is 31½ inches long and has a planked mahogany hull. Radio control optional; engines of .09 to .35 cu. in. displacement. Molded plastic fin, hatch cover, interior. Scored decking, hardware, decals. $9.95.

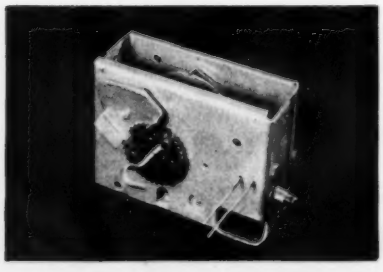
► *Plastikit B-66:* When you push the button on top of this Air Force B-66 bomber, the bomb bay doors open and the bomb falls out (Monogram Models, Inc., 3421 W. 48th Place, Chicago 32, Ill.). Completely molded to precision scale dimensions, kit has two movable tail cannons, landing gear that can be installed retracted or extended. Retails for 98c.



► *O & R Mariner:* Advanced design marine .049 by Harry Rice (O & R Products Division, Cheminol Corp., 9307 E. Bermudez St., Rivera, Calif.) features rear end flywheel, making for easy starts, and lower mounting. Selling for $7.95, includes flywheel and integral rear-engine coupling. Water-jacketed to insure good cooling.

► *The Jenny:* At $6.95, Scalemaster Models, Inc., 28 Ionia Ave., Grand Rapids, Mich., has 44-inch controlline model of the famous Curtiss JN-4D, complete to "birdcage wiring." Includes scale type World War I wheels. Die-cut balsa including over 60 wing ribs. Metal stampings, decals, shaped leading edges. Embossed nose cooling louvers.

► *Multi-Controls:* On single-channel, by means of Ectron Products Co. (Box 393, Smyrna, Ga.) multi-compound escapement. Right, left, up and down, with motor control, all from ordinary keying button. Unit synchronizes automatically with firm's Rapitrol installation. Lists for $11.95.



► *Super Ringmaster:* Designed by Matt Kania, Sterling Models (Philadelphia, Pa.) has big 42-inch wingspan stunt model for $3.95. Engines of .19 to .35 cu. in. displacement. All parts die-cut or shaped. Includes hardware, formed landing gear, step-by-step plans.

► *Spray Cans:* For slick finishes without messy brushes, there's nothing like a spray can of colored dope. Available at 98c for four ounces, or at $1.79 for 12 ounces, the Spray Cans come in many colors. Spray Cans are product of Pactra Chemical Co., Inc., 1213 Highland Ave., Los Angeles 38, Calif.

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MAN at Work

(*Continued from page 2*)

his career. As enthusiastic as we get over International competition, we do, nevertheless, have to face up to the fact that there is no bridge whatsoever between the mass of younger modelers and this advanced, for-the-select-few, kind of competition. Your advanced competitor wants tough competition. He views the Wakefield, for example, as the pinnacle, an event for only the cream of the crop. But what good does this do the typical young modeler?

Sure, let's keep our place in this kind of world-wide competition, but do not be blind to the young modelers whose number is legion—who fly models for fun and can't get to contests because there are no contests or events for them. What matters is that there are only 15,000 to 20,000 AMA members with upward of a million unaffiliated hobbyists. Promotion should benefit the hobby as a whole.

Chuck Tracy of The Cleveland Press, which sponsors a mammoth indoor competition each year (Soup Up That Pre-Fab, 10/55; Fun with Pre-Fabs, 8/53) makes this pertinent comment; "There is a definite tie that should be exploited between AMA and the manufacturers. Perhaps something like our indoor pre-fab contest. It should have some kind of mass appeal; low-cost model kits should be widely manufactured and distributed; contests held for such models, including the Nats. AMA should recognize records. Manufacturers should work in improvements from year to year, but not make major changes. The kits should be staples. The whole plan should be tied in with National Aviation Council program in schools, etc. This would not replace present AMA work. It's as simple as this!"

Do we need a promoter-director? We don't have to sell officialdom on the importance of airplane modeling. It is more likely that an interested officialdom needs to be shown how it can boost youth in aviation. Everyone, except the Civil Air Patrol, considers modeling essential. Or so they say.

Last summer, the Civil Aeronautics Administration and the Jr. Chambers of Commerce combined forces on an Aviation Incentive Movement which included model airplane activity. An article in the Wall Street Journal brought CAA 100 letters of commendation. Last August, the American Legion sent a memorandum to the members of their Aeronautics Committee and Department Aeronautics Chairmen, local posts, recommending that they participate as local sponsors in the Aviation Incentive Movement. The Legion also prepared a piece of proposed legislation in connection with the CAA AIM Plan, introduced in the House by the Honorable Percy Priest. Designated H. R. 7800, this was referred to the Committee on Interstate and Foreign Commerce. In their Tenth Annual Convention last August, the Flying Farmers made support of AIM one of their objectives.

The Aviation Incentive Movement is too important to come to naught. Modeling is one of its phases. But it is the belief of this magazine that the modeling phase of AIM may be lost in the shuffle. Not only do CAA and the JCC know virtually nothing about modeling but, on the local level, where the JCC is supposed to encourage and promote modeling things, there is, inevitably, a sad lack of know-how. If we are to convert high-sounding publicity at the top into nation-wide model building and flying, locally, we have to fight every step of the way.

Therefore, we need a non-modeling AMA director as we need a hole in the head. What we need is some effective program from dear old NAA coupled with a live-wire director who knows the answers. And what of NAA?

At the NAA Convention, Russ Nichols was to report for AMA. He did not sit at the speakers' table. As one eye witness commented, "If NAA wants to be so almighty aware of aviation education, let them recognize the model plane as the best means for spreading the word, raise a fund to pay Nichols a good annual wage, give him a good contract, then outline a few projects for him to do." Regardless of whether it is Nichols or someone else as director, NAA should play more than a perpetually passive part in the promotion of AMA. There never has been outlined a program with guts and no one has ever enjoyed the authority, the tools and the specific direction to stand the chance of obtaining the results we demand. If NAA can think of a seven-figure plan for an aviation center building in Washington, they can surely find the paltry sum needed for a good AMA program, Isn't Air Youth worth it? If you have to sound off, tell it to National Aeronautic Assn., 1025 Connecticut Ave., N.W., Washington 6, D.C.

* * *

► Being highly in favor of people in this field who, like MAN, have reached the quarter-century mark of service, dropped in on America's Hobby Center to congratulate Bernie Winston on AHC's 25th anniversary. You could have knocked us over with a Kaysun prop when it turned out that Bernie had been a demon modeler. AHC is the giant of the mail order business. "How did it start?" we asked Bernie. So there was Bernie, the Horatio Alger kid, long ago, 1/16 squares in hand, homeward bound from the stone age equivalent of a hobby shop, wondering why he shouldn't cut his own wood. When your old time modeler saw that light, he always went into business. Ah, the old timers remembered! Chap named Bolger, somewhere in the Bronx. Remember asking Pappy Winter to stop there for some "light" easy-to-carry wood for our backyard "hobby shop." By the time Pappy carried 12 2 x 6's to Jersey, he took a dim view of model aeronautics.

Heh, Bernie, come back here! AHC mail order (they also wholesale) is an incredible operation. Modelers all over the world and in every precinct of the U.S.A. as well turn to AHC when they haven't a hobby shop handy or when, as sometimes is the case, the hobby shop won't handle the things we need. AHC has the familiar mail order headaches. You know, no name and/or address, followed by an unsigned demand for service, followed by a blast from Maw, but with no address. Or a box filled with exotic bills from 'way off somewhere—worth 11c according to the expert at the bank! The thing that most impressed us was the fantastic number of hard-to-get, no-longer-made items that Bernie lays hand on to fill special requests. If an item can't be found at AHC, it ain't (pardon) to be had. May AHC be around for a Golden Anniversary.

* * *

► Scattergun Department: Fifth Annual Winter Meet, Polar Buzz Bugs, January 29, White Bear Lake, Minn.; official event of St. Paul Winter Carnival (Donald Monson, 963 Hall Ave., St. Paul 7, Minn.) . . . Galesburg, Ill. Model Airplane Club (Ken Johnson, 350 Park Lane Ave.) challenges any and all clubs in the country to a team race contest at any agreed-on battleground, AMA rules. Moir, you going to take that sitting down? And Storey? . . . Berkeley Models, Inc., says that number

(*Continued on page 53*)

MONEY-SAVING SPECIALS

"Champion" Electric OUTBOARD MOTOR

3 to 6 Volts. Takes up to 24" boats.

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DOPE BRUSHES

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Handy transparent plastic parts boxes with hinged tops. Measures 1⅝" x 2¼" x ¾" high. Ideal for small parts storage.

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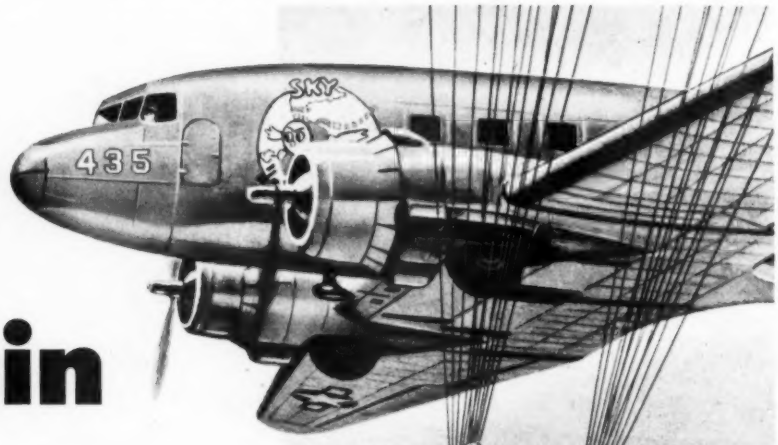
C★47 Skytrain



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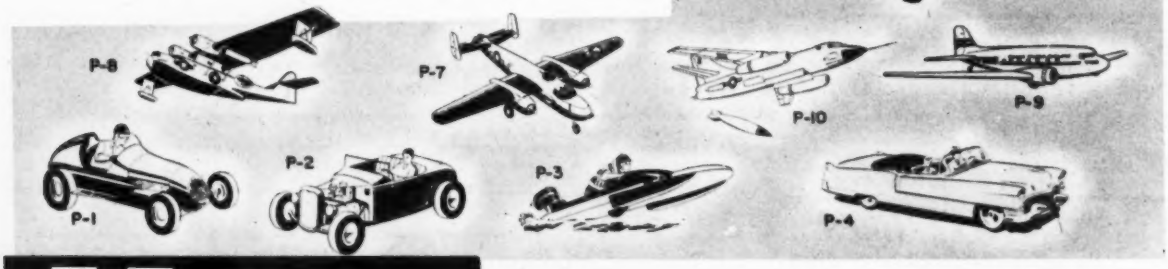

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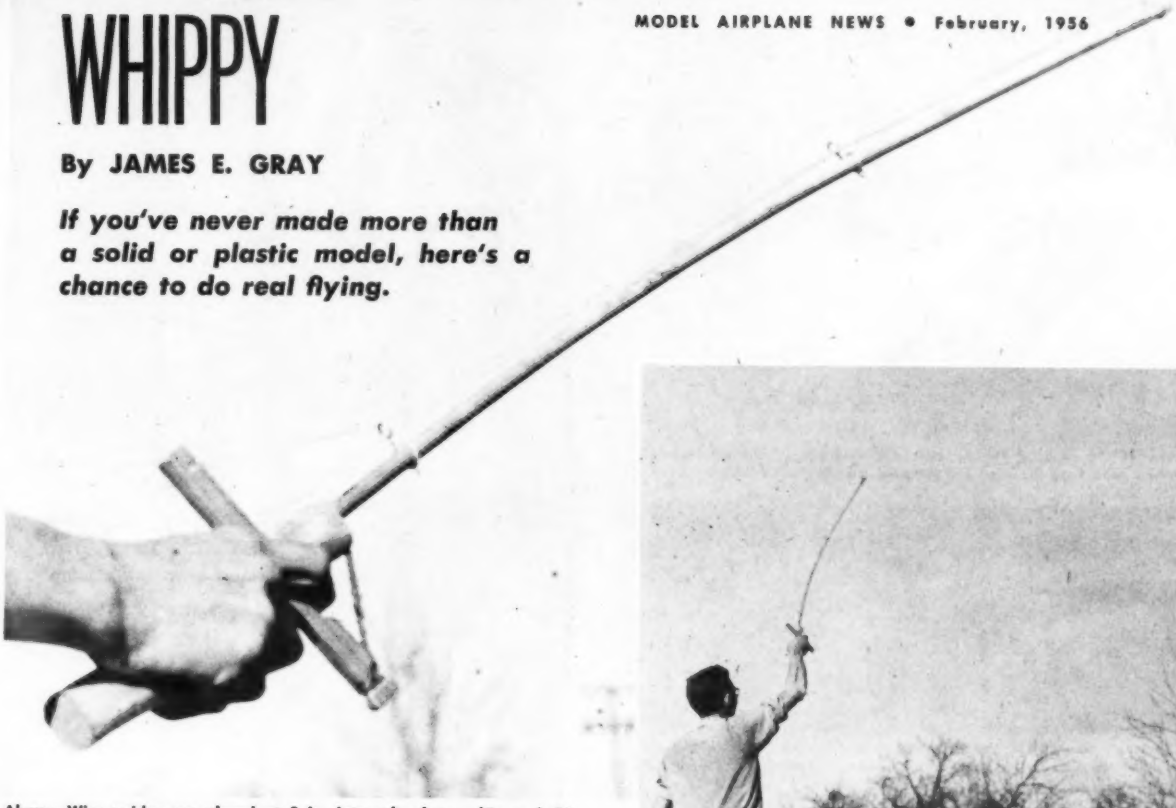
WHIPPY

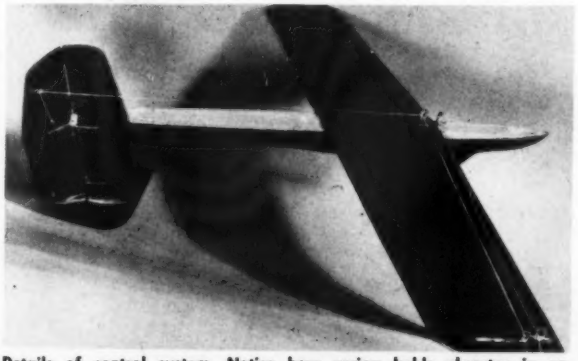
By JAMES E. GRAY

If you've never made more than a solid or plastic model, here's a chance to do real flying.



Above—Wire guides are placed at 2 in. intervals along whip to hold lines. Right—Long lines provide realistic flight, permit maneuvers. Although Whippy is fairly slow in flight, will respond quickly.

Handle does not have to be fancy. Metal tube inserts into handle, accepts the dowel. You can interchange whips for long, short lines.



Details of control system. Notice how spring holds elevator in up position. A slight tension on the controlline depresses the elevators.

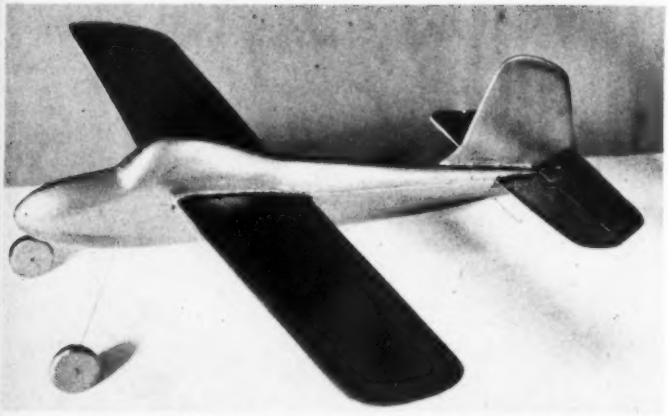
► Whether you are an old-time controlline fan or a newcomer to the hobby, Whippy will amaze you. Utilizing a combination of elevator control and whip power, it flies without a motor, yet it responds instantly to your control. Precision flying and perfect landings are a cinch. Combat flying, team aerobatics, carrier landings —Whippy does 'em all. And there's enough room to fly Whippy on the average lawn.

Construction is simple. The model is made from solid balsa; the control handle is made from a few scraps of easily obtainable material—soft pine block will do it nicely. Both can be assembled in a single evening.

Start off with the fuselage, which is carved from 1 x 2½ x 12 in. block of medium balsa. Make cardboard templates from the plans and carefully carve the block to top and side profiles, then carve and sand it to an elliptical cross-section. When it has been sanded to shape, cut the fuselage lengthwise in half. Starting at the back, cut straight forward 1½ in., then angle up toward a point ⅛ in. above the center of the nose. This will automatically place the wing at an approximate 1° angle of incidence.

Hollow out the rear portion of the lower half of the fuselage and cut a small notch in the rear to provide clearance for the controlling line. Bend the landing gear to shape from 1/16 in. wire. Cut a deep slot in the belly of the fuselage with a pen knife, push the landing gear up in the slot and cement it in place. Attach the tail skid.

Now cut the wing to shape from a sheet of ¼ x 3 x



Close-up of the finished model shows its simplicity. Cutting, sanding of wood is about all the work—if you can call that work. Like a glider.

Well, come to think of it, you do have to make with the needle nose pliers, here bending ¾ in. prongs on small coil spring for elevators.

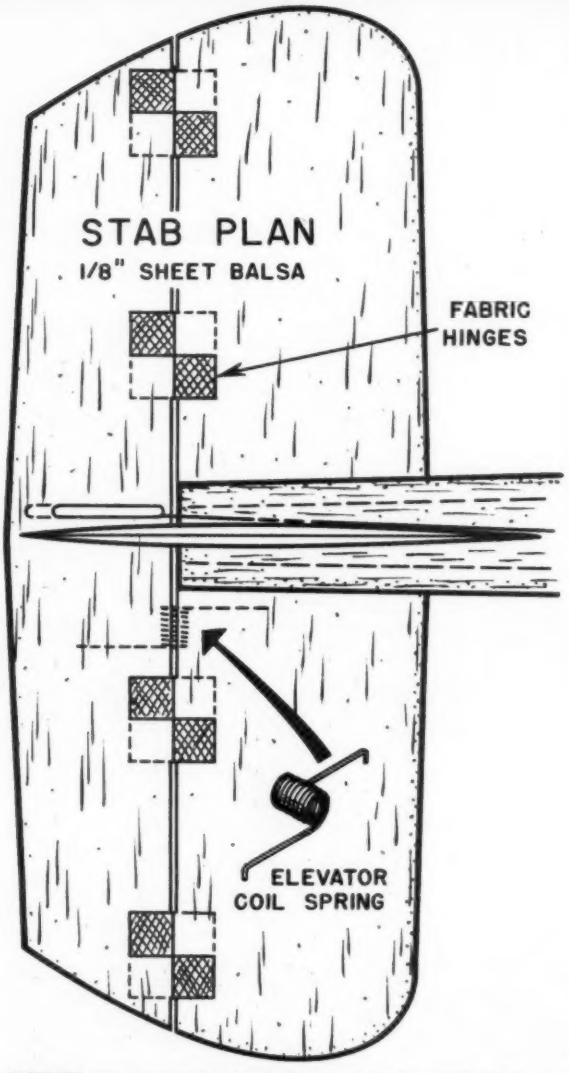
18 in. balsa, then sand it to a smooth airfoil section. Form the dihedral by cutting the wing almost in two in the center, inverting it on a table or workbench and placing a ⅜ in. block under the center. Be sure both tips rest on the table. Cement the center joint heavily.

Bend the wing tip guide from 1/32 in. music wire and cement it under the tip of the left wing so that the forward loop is ½ in. from the LE. Cement the whip line anchor and the controlline guide in the bottom of the wing as shown. Small screw eyes were used in the original, although the anchor and guide may be bent from wire.

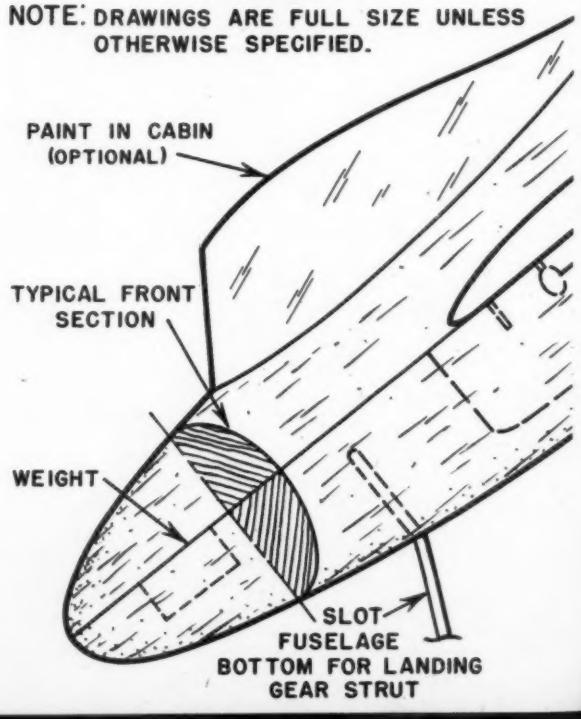
Next come the stabilizer and elevator, cut to outline from a sheet of ⅛ in. hard balsa and sanded to a streamlined cross-section. Gauze hinges attach the elevator to the stabilizer and the elevator bears a small expansion spring ½ in. long and about ⅛ in. in diameter. Straighten out a couple of coils on each end of the spring so that you have two straight prongs of wire about ¾ in. long. Bend these prongs so that they are at 90° angles to each other and cement the spring to the bottom of the stab and elevator, making it hold the elevator in up position. Very little pressure should be required to depress the elevator but the spring should have sufficient tension to return it immediately to up position when pressure is released. Cement to the elevator a control horn of 1/16 in. wire and then cement small squares of gauze over the prongs on the spring and the horn for maximum strength.

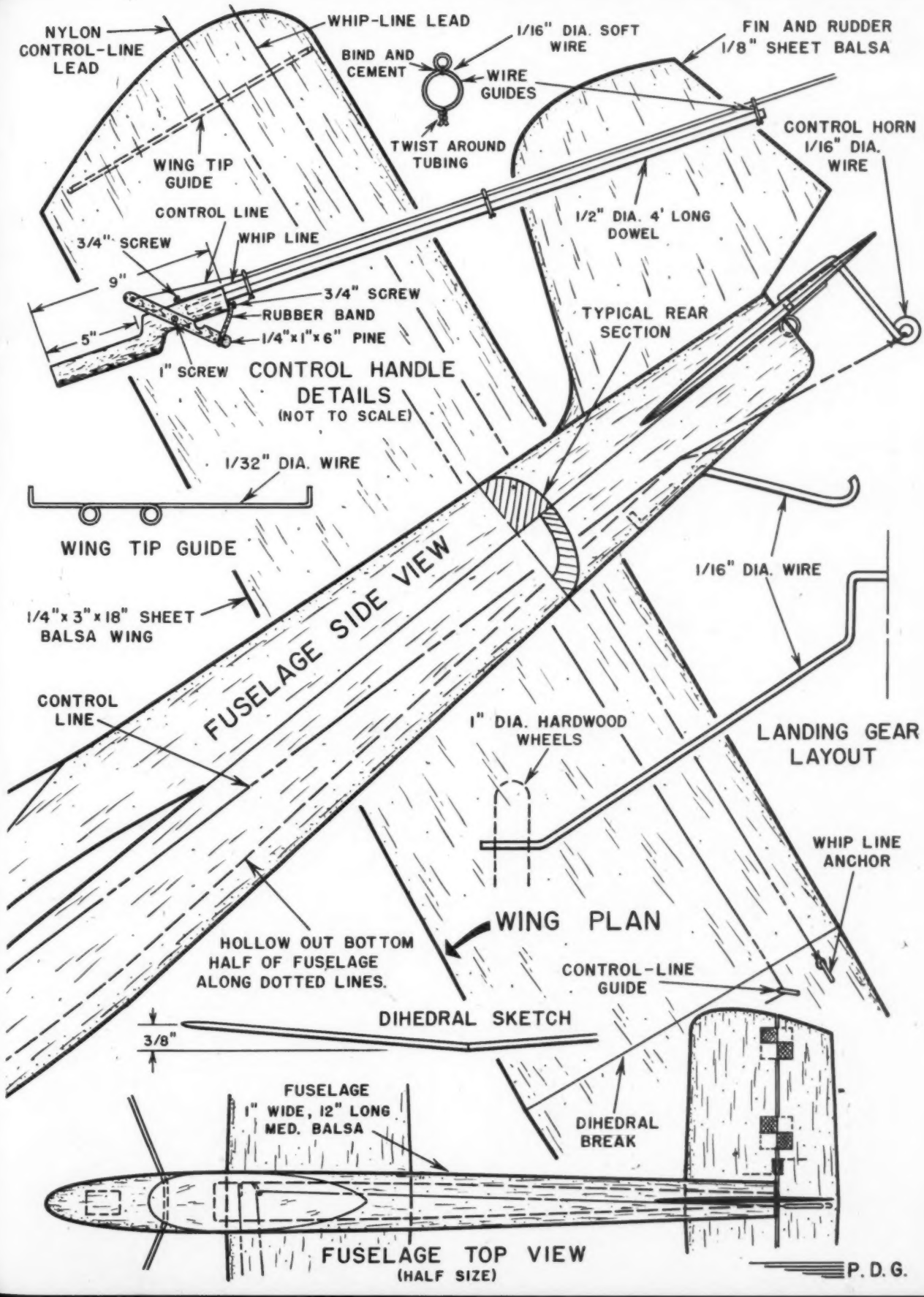
The rudder is of ⅛ in. sheet balsa, sanded to streamlined cross-section, while the small fillet may be formed from any ⅛ scrap.

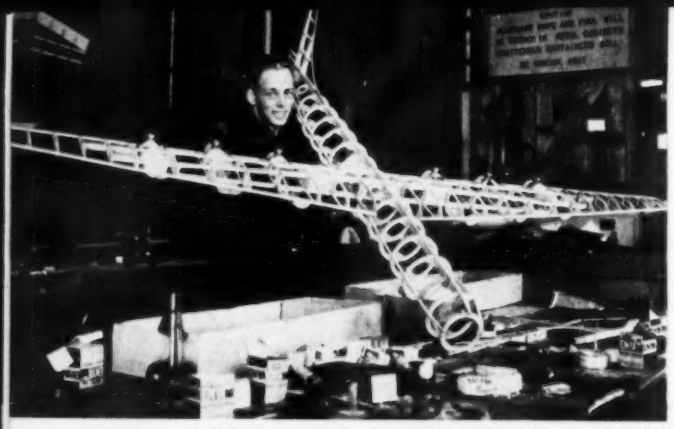
This brings us to assembly. Cut out the top section of the fuselage to fit the wing and stabilizer and cement in place. Run a nylon whip line lead through the front loop in the wing tip guide and tie it to the whip line anchor. Thread the controlline lead through the rear loop of the wing tip guide (*Continued on page 48*)



NOTE: DRAWINGS ARE FULL SIZE UNLESS OTHERWISE SPECIFIED.




NYLON CONTROL-LINE LEAD
WHIP-LINE LEAD
1/16" DIA. SOFT WIRE
BIND AND CEMENT
WIRE GUIDES
FIN AND RUDDER 1/8" SHEET BALSA
TWIST AROUND TUBING
CONTROL HORN 1/16" DIA. WIRE
WING TIP GUIDE
1/2" DIA. 4' LONG DOWEL
CONTROL LINE
WHIP LINE
3/4" SCREW
9"
3/4" SCREW
RUBBER BAND
5"
1/4"x1"x6" PINE
1" SCREW
CONTROL HANDLE DETAILS
(NOT TO SCALE)
TYPICAL REAR SECTION
1/32" DIA. WIRE
WING TIP GUIDE
1/16" DIA. WIRE
1/4"x3"x18" SHEET BALSA WING
FUSELAGE SIDE VIEW
CONTROL LINE
1" DIA. HARDWOOD WHEELS
LANDING GEAR LAYOUT
WHIP LINE ANCHOR
WING PLAN
HOLLOW OUT BOTTOM HALF OF FUSELAGE ALONG DOTTED LINES.
CONTROL-LINE GUIDE
DIHEDRAL SKETCH
3/8"
FUSELAGE 1" WIDE, 12" LONG MED. BALSA
DIHEDRAL BREAK
FUSELAGE TOP VIEW
(HALF SIZE)
P.D.G.



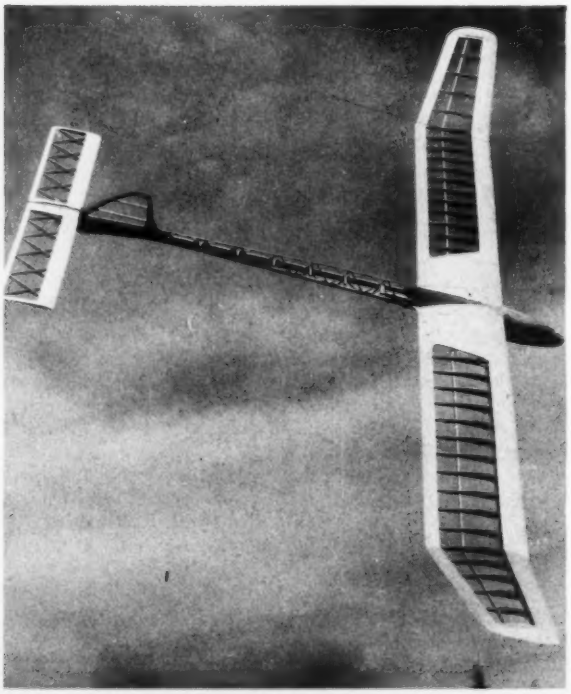
RB-36 was built in two weeks for Armed Forces' Open House at Fairchild Air Force Base. Dick Ryder and James Perry used Jap kit, Enya .19's.

Only deviation from scale was the exposed heads of the engines. Gross weight is 17½ pounds. Model also flown at the Lilac Parade, Spokane.

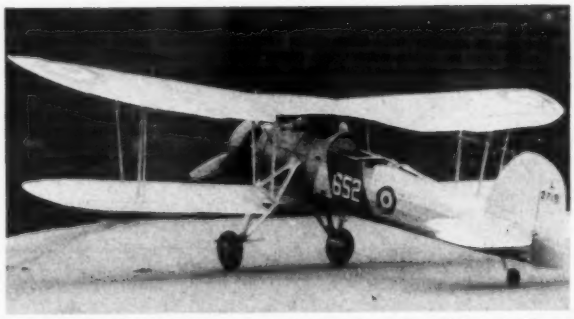
AIR WAYS

Why many people make model plane building a lifetime hobby is easy to understand after viewing reader-built ships like these.

Hawker Demon is free flight scale by D. Bryant, England. Pendulum rudder, elevator control. Span 44 in.; weight 3 lb. 2 oz. Elfin 1.8 cc.



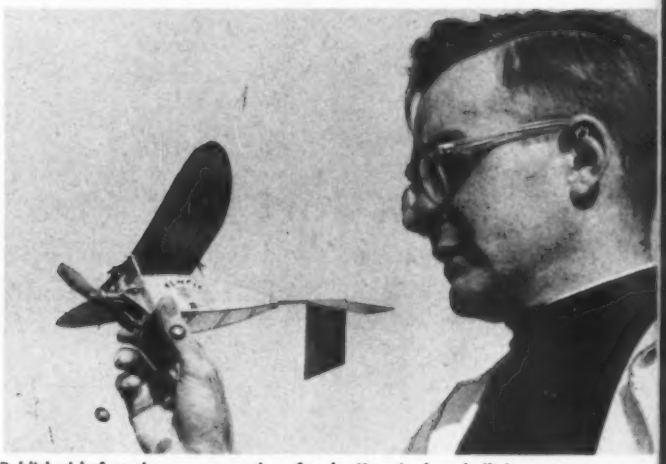
Excellent construction stand-outs on Nordic type glider, P. T. Guilmant, San Angel, Mexico. Benedek 8306B wing section, 3½ degrees incidence.



Nice detail makes Cpl. Winter's (England) Fairey Swordish look bigger than its 24¾ in. span. Allbon Dart-powered, it took 10 months' work.

Unique Wakefield by Ronald Pollard, England, features a much smaller than usual stabilizer; huge propeller; geodetic, sparless wing frame.

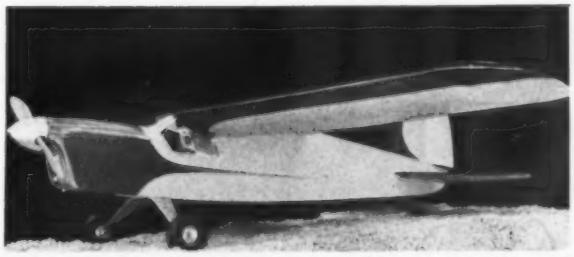
Still another free flight by D. Bryant is this 54 in. Rumpler Taube. Mills 1.3 cc Diesel for power, 22 ounces weight. Note team race pilots.



Published before the war were plans for the Kewpie, here built in same size by Oliver Warner. Has double-sized .049; another four times up.

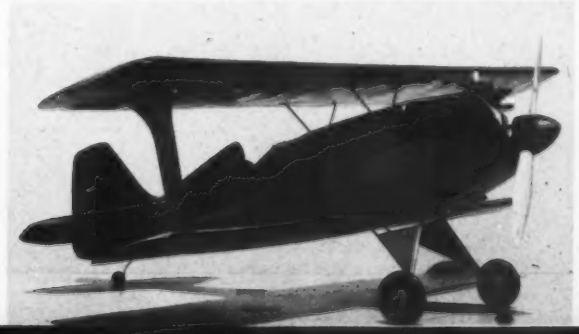
Allbon Javelin-powered Aeronca Air Sedan was built from a Mercury kit (English) by Ron Adams, London. Span 58⅜ in. Blue, scarlet, flies well.

Staggered wing team racer by Lt. James Reid, USN, has Enya .29 in the nose, features thin wings. Reverse stagger gives nose-high landings.

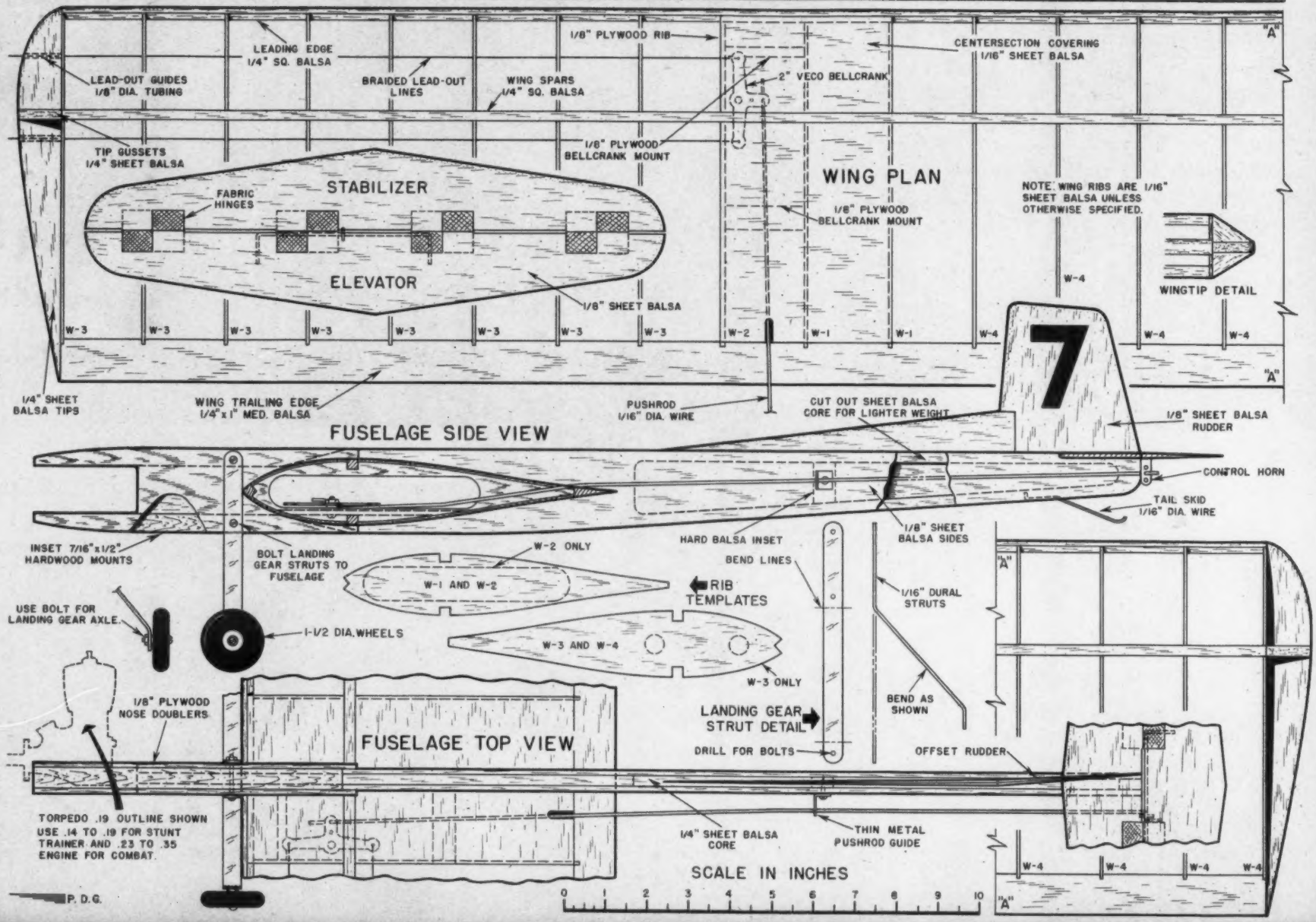


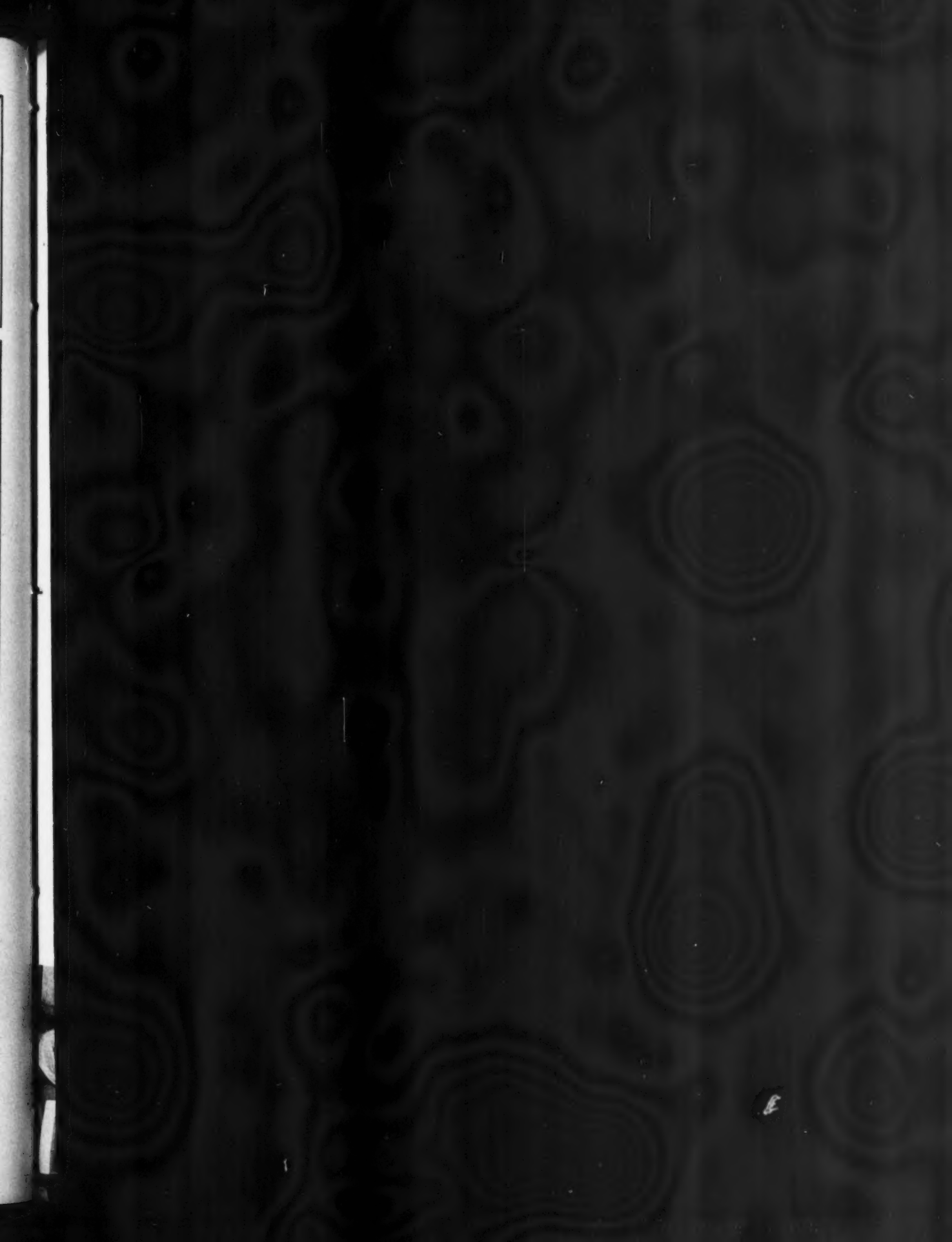
Hi Boy, from August '54 MAN, is work of Ed Sweet, Beloit, Wis. With Torp. 19, 9 x 6 Top Flite prop, weighs 36 ounces. By Palmer and Goyet.

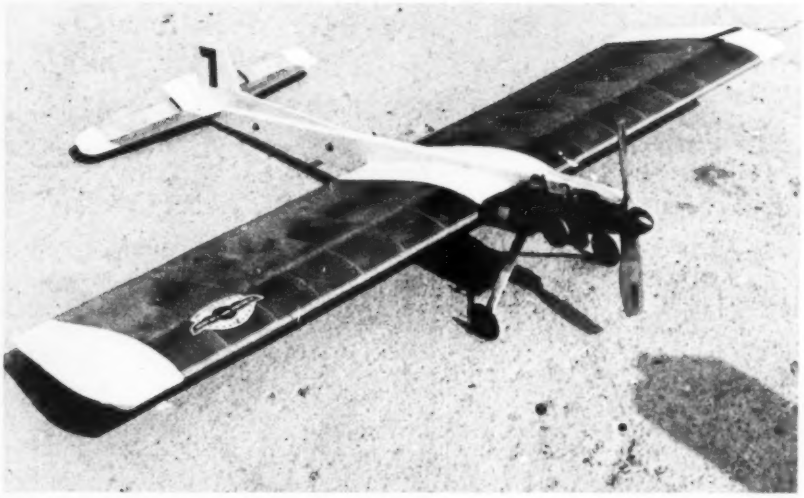
Hot buggy is 36 in. bipe by Bob Hack, San Antonio, has reworked Super Cyclone turning a 12-9. Does eights right off the deck. And no wonder!



FULL SIZE PLANS AVAILABLE. SEE PAGE 44.







With the ED .15 Diesel in this picture, the Sportster flew smoothly on 60-foot lines, though 52 feet are recommended for the beginner. Unusual for a designer, author stuck to the standard wood sizes.

Stunt Trainer

By DENNIS SCHAUER

For any lug-mounted engine of .15 to .25 capacity, this maneuverable profile features stability and ease of construction.

► I had the novice stunt pilot in mind when I designed this trainer (and called it The Sportster), equipping it to follow the stunt pattern at low cost and least effort in construction. This model will take any lug-mounted engine from .15 to .25 displacement. The original model had an English ED 2.46 Diesel and flew beautifully on 60 ft. lines, although it would be a good idea for beginners to use 52 ft. lines.

The simple construction follows standard building procedures and uses stock sizes of wood readily obtainable in any hobby shop. Build the wing first, as the model is constructed around it. Start by cutting the ribs and notching the TE. Cut 18 ribs (W-1) out of 1/16 in. sheet balsa and one rib out of ⅛ in. plywood. The center section ribs are cut 1/16 in. smaller than the other ribs in the wing to allow for planking. Assemble the ribs on the ¼ in. sq. spars and TE, then add LE and plank bottom of wing and fit bellcrank mount.

Attach lead-out wires to 2 in. bellcrank and install in wing. Add 1/16 in. piano wire pushrod and plank top of center section with 1/16 in. sheet balsa. Then add ¼ in. sheet tips and ⅛ in. copper lead-out tubes in inboard tip. Firmly attach 1 oz. lead weight in outboard tip. This completes the wing structure.

The fuselage is built out of a ¼ in. soft balsa sheet core and ⅛ in. medium sheet sides. The cut-out rear of the wing is to help balance the long tail moment. This also makes a light, strong fuselage. First, cut the ¼ in. sheet core; then cut ⅛ in. sheet sides and add ½ x 5/16 in. hardwood motor mounts. Then cut the ⅛ in. plywood motor mount doublers and glue in place. Clamp the complete assembly while drying. Use Wilhold or Weldwood glue for mounts, as either will give extra strength.

Next, cut stabilizer and rudder out of ⅛ in. medium sheet balsa and sand to an airfoil shape. Install a Kenhi or Veco elevator horn and hinges on elevator. This brings us up to final assembly.

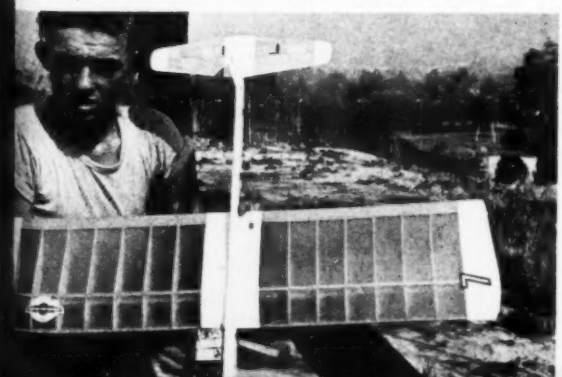
Cement wing exactly in the center of the fuselage, then cement on stabilizer and rudder. Next, bend pushrod and install in elevator horn and solder a washer in place to hold the pushrod in the elevator horn.

Cover wing with silk or heavyweight Silkspan and give the entire model 10 to 15 coats of clear dope, sanding lightly between the fifth and tenth coats of clear dope.

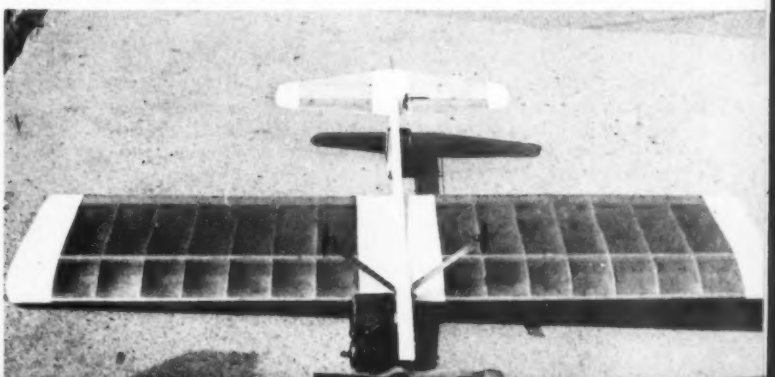
Let your own taste guide you in color-doping the model, but be sure to fuelproof, if dope used had not been Butytate. Make the landing gear out of .050 in. (61-ST-4) aluminum and bolt it to the fuselage. Install your favorite engine and fuel tank. Then attach the 1½ in. dia wheels and 1/16 in. piano wire tail skid in place.

And here are a few words on flying your completed model: the model is extremely stable and will do the entire stunt pattern with ease. (*Continued on page 45*)

With this design for a magazine under his belt, Schauer then won team and proto at the Nationals. Used 15 coats of clear.



Landing gear can be left off for combat. But if combat is intended, it is advisable to beef up the leading edge of this lightly-built wing. The fuselage longer than usual.

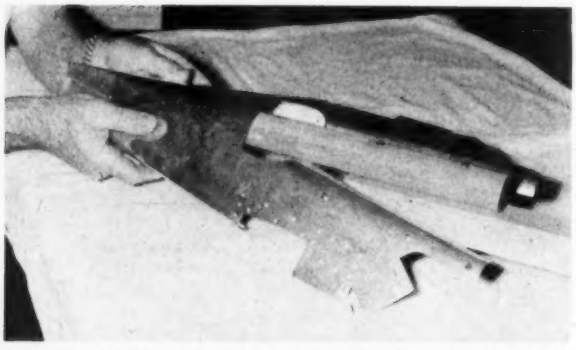


Granger and Lawrence Williams checking K & B Allyn .23 in an all-metal Skeeter. Three Williams' metal jobs silhouetted opposite page.

All Metal!

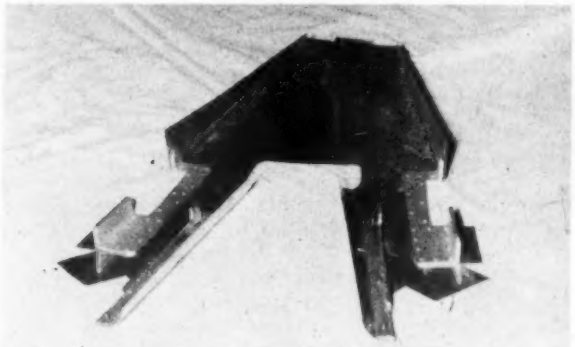
Part Two

By GRANGER WILLIAMS

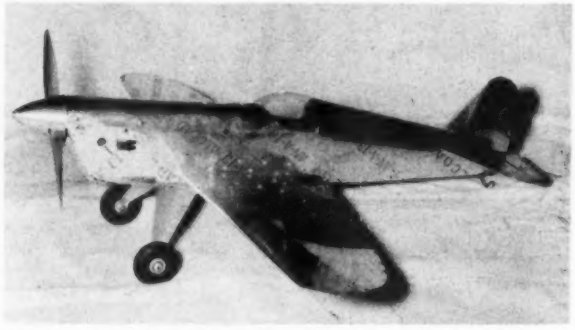


Bending the back of the fuselage. Materials fully explained in text. Author's first all-metal model was retired after three years of flying.

Bending upper forward portion of the cowling. Bottom of the fuselage already is bent. Engine mounts, foreground, are ready to be installed.



In this picture the cowl has been bent and the wing and engine mounts have been installed. Last month, author covered wings, tail surfaces.



Before the finished model is painted, there's no mistaking that it's a metal job but, once painted, you'd never think it wasn't made of wood.

► A metal model will withstand much more punishment than a wooden one. During a Team Race a few years ago, I crossed lines with a landing model and had to dive my ship into the asphalt at top speed and at a 45° angle to avoid entangling the others in the air. The greatest damage resulting from the crash was to the engine crankcase and the engine cowling. The dents and wrinkles in the wing and fuselage were ironed out without harming the synthetic paint job and, aside from a few scratches on the landing gear, the model looked almost as good as new. A wooden model would have been almost completely demolished in such a crash. This model was eventually retired after three years of Team Race and demonstration flights.

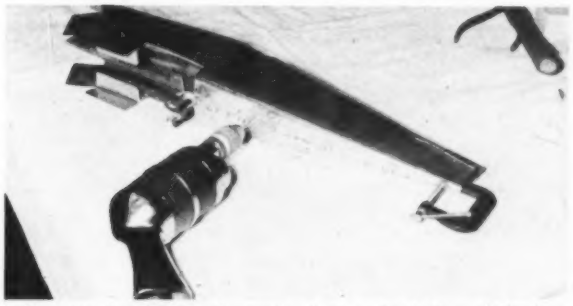
Improper handling has caused the greatest damage to a metal model. For example, picking it up by one tip will collapse the ribless, sparless wing and may result in kinks that will require replacement of that part of the model.

The model presented now is typical of low-wing model construction, with the wing and landing gear mounting brackets of one piece, one on each side of the fuselage. This type of mounting should be used whenever possible.

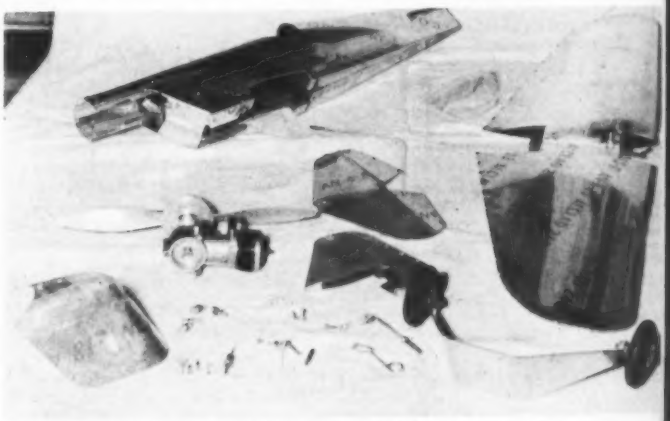
When building a mid-wing or shoulder-wing model, the engine, wing and landing gear can be mounted on one-piece brackets, as illustrated. Also note the typical radial mount for the same type model when the engine is installed lying on its side with cheek cowlings. Cheek cowlings can be rather easily made by carving a wood block to desired shape and size. Make a female mold of plaster large enough to stand some rough handling by casting it around your finished wood block. Front and rear cooling openings should be extended in the plaster cast. Use .016 to .020 in.

Noteworthy developments that contribute to progress must be reported. We've seen metal in speed—now all metal! It's worth checking.

This is the very Cosmic Wind Minnow that won first place for author at the 1952 Nationals team racing event (disassembled for this picture).



Drilling the rivet holes in the overlap joint on the bottom of the fuselage. Some portions of the nose section have not been bent to shape.



By comparing the fuselage in this picture of finished, but unpainted, parts, the direction of final bends is seen. Compare with top picture.

thick S.O. aluminum sheet for forming and cut a piece just a little larger than you think you will need to fill the cavity in the plaster. Use several size dowel sticks with the ends rounded to work the metal into the mold. Start with the largest dowel stick and rub the surface of the metal over the cavity in the mold, working from side to side and back and forth. At first it will seem as though you aren't getting anywhere but keep at it and you'll find that the metal begins to drop into place and you will work more easily as you go along.

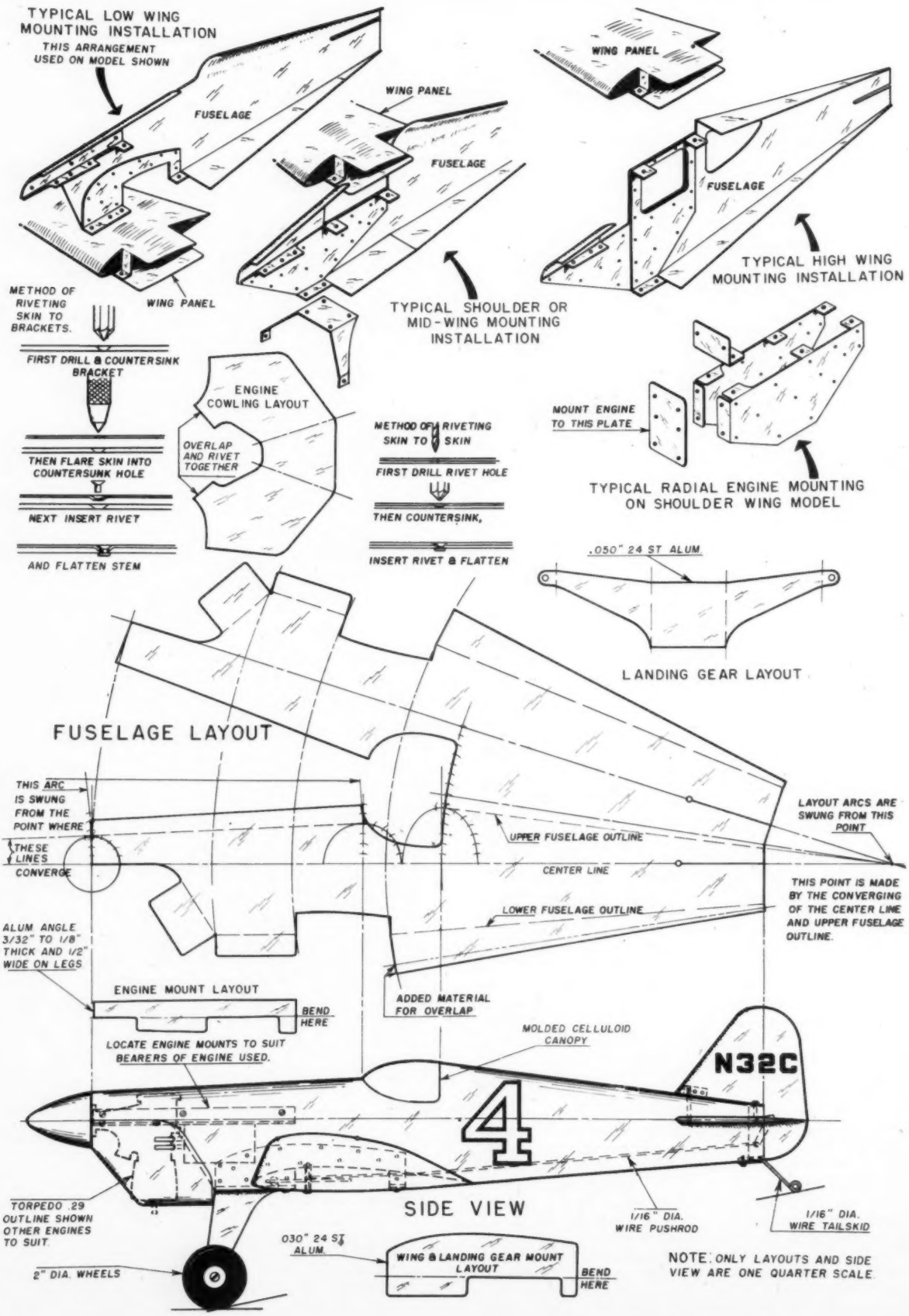
When building a high wing model, you can make the mounting brackets very like those for a mid-wing job, with engine, wing and landing gear in one piece. If windows are to be cut in the sides at the wing location, it may be necessary to add an extra thickness of material at these points. Lightening holes may be cut into the pieces and the brackets, if necessary.

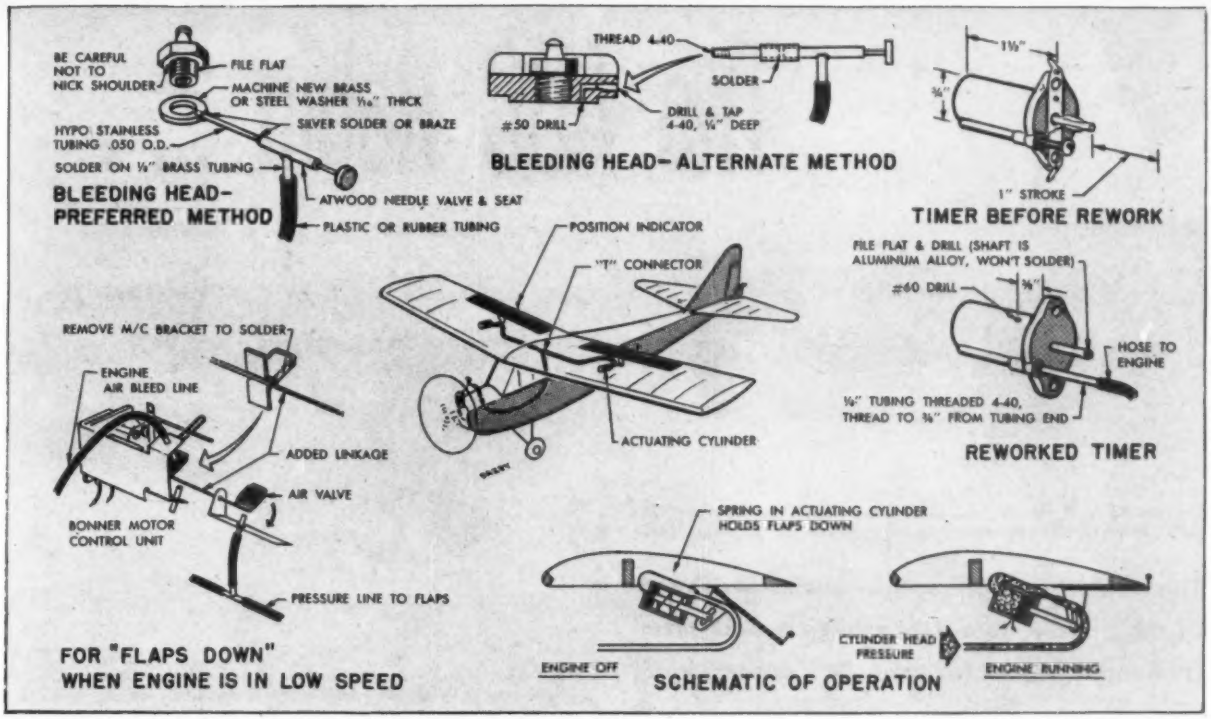
The pattern for the fuselage is a little more difficult to lay out but, except for the engine cowling, is usually one piece. On models in which the front or rear cowl lines are not parallel with the thrust line, extend the lines as shown in the pattern until they meet the thrust line and describe an arc with a radius from the point of intersection to the point of cross-section being determined at each end of the cowling. Then lay out a cross-section of the fuselage at the two points and with a pencil compass set at about ¼ in., determine the semi-circumference of the cross-section from the thrust line to the top center line of the model and mark this distance on the arcs as shown. A line drawn between these points will be the actual top center line of the pattern.

If the model has a curved bottom cross-section, the same should be done there. This will give you half the pattern you will need for the fuselage and you can either use it as is, or draw the other half connecting them together at the back for a full pattern. Reinforcements are required at the points where the landing gear and wing are mounted and are usually designed to allow bolting the wing and landing gear to the fuselage. These are shown on the drawing in pattern and on the side view in dotted line.

For my models I use .010 or .012 in. 24 ST aluminum sheet with reinforcing strips of .030 in. aluminum sheet or aluminum angle of the right size and thickness. Rivets used are 1/16 in. flush (*Continued on page 49*)

PLANS FOR "ALL METAL" ON NEXT PAGE


TYPICAL LOW WING MOUNTING INSTALLATION
THIS ARRANGEMENT USED ON MODEL SHOWN
FUSELAGE
WING PANEL
WING PANEL
FUSELAGE
TYPICAL SHOULDER OR MID-WING MOUNTING INSTALLATION
WING PANEL
FUSELAGE
TYPICAL HIGH WING MOUNTING INSTALLATION
METHOD OF RIVETING SKIN TO BRACKETS.
FIRST DRILL & COUNTERSINK BRACKET
THEN FLARE SKIN INTO COUNTERSUNK HOLE
NEXT INSERT RIVET
AND FLATTEN STEM
ENGINE COWLING LAYOUT
OVERLAP AND RIVET TOGETHER
METHOD OF RIVETING SKIN TO SKIN
FIRST DRILL RIVET HOLE
THEN COUNTERSINK,
INSERT RIVET & FLATTEN
MOUNT ENGINE TO THIS PLATE
TYPICAL RADIAL ENGINE MOUNTING ON SHOULDER WING MODEL
.050" 24 ST ALUM.
LANDING GEAR LAYOUT
FUSELAGE LAYOUT
THIS ARC IS SWUNG FROM THE POINT WHERE THESE LINES CONVERGE
UPPER FUSELAGE OUTLINE
CENTER LINE
LOWER FUSELAGE OUTLINE
LAYOUT ARCS ARE SWUNG FROM THIS POINT
THIS POINT IS MADE BY THE CONVERGING OF THE CENTER LINE AND UPPER FUSELAGE OUTLINE.
ALUM. ANGLE 3/32" TO 1/8" THICK AND 1/2" WIDE ON LEGS
ENGINE MOUNT LAYOUT
BEND HERE
ADDED MATERIAL FOR OVERLAP
LOCATE ENGINE MOUNTS TO SUIT BEARERS OF ENGINE USED.
MOLDED CELLULOID CANOPY
N32C
4
SIDE VIEW
TORPEDO .29 OUTLINE SHOWN OTHER ENGINES TO SUIT.
2" DIA. WHEELS
.030" 24 ST ALUM.
WING & LANDING GEAR MOUNT LAYOUT
BEND HERE
1/16" DIA. WIRE PUSHROD
1/16" DIA. WIRE TAILSKID
NOTE: ONLY LAYOUTS AND SIDE VIEW ARE ONE QUARTER SCALE.



Pressure, bled off from cylinder head, holds flaps up when engine runs. When engine cuts, flaps come down. Small model needs but one actuator.

FLAP Those Wings

By FRANK C. DAZEY

Now here's some ingenious gadgetry that has the Coast boys talking to themselves. Slow approaches, both radio and Carrier.

► Wing flaps are as big an asset to the typical RC model as they are to full size airplanes, judging by the flight results of Webb Hill and Byron Myer of the LARCs Club (Los Angeles Radio Controllers). The automatic system shown in the sketches was developed by Webb and has been thoroughly tested.

Flight results have always been excellent. Glide speed is reduced up to 50 per cent and the model will glide with a nose-up trim with no tendency to stall or scallop. If the model flies nose-heavy, the flaps will pull the nose up slightly in the glide. On a model which flies tail-heavy, the flaps will dampen out the scalloping tendency.

Byron Myer's ship, flaps down. With glide speed slowed 50%, plane can glide nose up without any tendency to stall or scallop. Hits the spot.

The lower glide speed makes heavy RC models safer to fly and also makes it much easier to earn more spot landing points in contests. There is more time to plan the landing approach and the model is less apt to stall out and dive in when zig-zagging the approach.

Much flight testing with slope soaring RC models as well as with powered ships showed that flap area and angle are not critical. The contest winning ship has a 64 in. wingspan and a 9 in. chord. Each flap is 12 in. long by 2 in. wide and is depressed 40° down. Don't fly with "flaps down" and full engine power. Note position indicators! Every modeler will want to rig the system to suit himself. The sketches show how Webb does it. Models which glide more slowly than 25 mph need have only one actuating cylinder.

Two methods of bleeding the head are shown. Byron Myer uses the alternate method of drilling and tapping the head but it's safer to machine a special washer as shown to avoid the risk of damaging the engine. The tubing may be bent rather sharply to clear the cylinder head fins, but avoid straightening and rebending. On motors which normally use the short type of plug, the long type should be substituted, because the gasket is about twice as thick as the usual plug gasket. Test for leaks by pouring a little fuel over the plug, hold your finger over the end of the tube and put the piston on compression. If the seating surfaces are clean and free from scratches, no leaks should occur.

A small amount of oil will accumulate in the line running from the motor to the actuator and a trap must be provided to prevent this oil from gumming up the fine hole in the new, special gasket. Therefore, always have the line drop down from the motor (as shown) so that the trapped oil will accumulate at the lowest point in the system. After a day of flying, drain any residue oil out of the tubing. When the motor is running, the timer piston will *(Continued on page 48)*

The ABC Robin . . .

Eye-catching black, orange and silver color scheme, plus new and different lines—to our generation!—make stand-out job on flying field.

Sweepback, plenty of dihedral, large tail surfaces, adequate profile area, add up to genuine stability. Wing panels are quickly detachable.

England's first light single-seater produced in the middle 'twenties makes a delightful free flight model for that .049 powerplant.

By LLOYD V. HUNT

► England of the middle 'twenties was engrossed in this ABC Robin as the first low-powered single-seater to be produced in that country. ABC Motors, Ltd., assigned A.A. Fletcher to its first airplane design venture to utilize the two types of engines which they were already producing: the 30-40 hp Scorpion and the 60-70 hp Hornet. The model presented here is the version powered by the Scorpion. The plans are drawn to scale of 1½ in. to 1 ft.; details of the configuration and construction were supplied by MAN and the NACA Aircraft Circular No. 101 dated Sept.-Feb., 1928-30.

Start construction by cutting the required ribs; notch the TE's and cut to shape the remaining details. Lay the TE flat on the plan and cement all the ribs in place except for the ⅛ plywood root rib. Block up the TE over the plan and aline all ribs before cementing the LE in place. The two rear spars are cemented in place along with the formers, then the front spars, along with their formers. Complete the assemblies by adding the root ribs (note their angle) and lastly the balsa blocks at the tips, hardwood dowels and wire hooks. Wrap the strut tubes to the ⅛ sq. strip and cement in place as shown; sand completely and recement all joints.

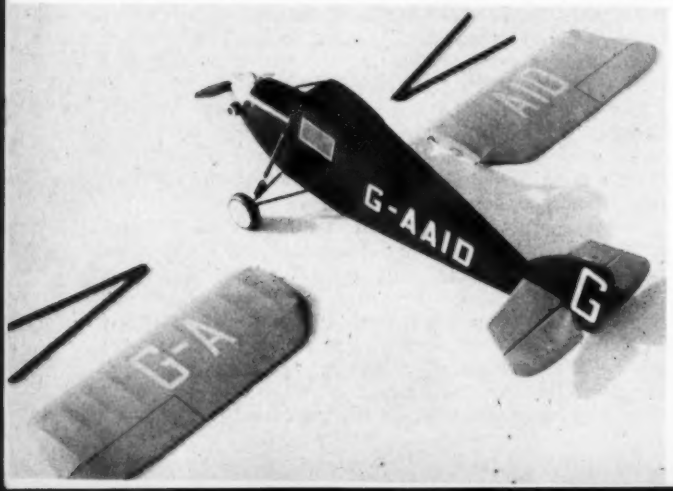
The fuselage is of conventional construction. Select medium balsa for the nose and cowling, shape to the contours and hollow out as shown. Do not sand to final shape until the remaining part of the fuselage is covered. Seat and controls may be added; their general shape and location are approximate. The center section ribs are cemented in place along with the angled aluminum tubes used to house the wing dowels. The tubes are wrapped with thread and boxed in. Before covering the center section, check the ribs for the correct dihedral angles. A window may be added as shown in the top view, but it is optional. The wings are held in place by rubber tension.

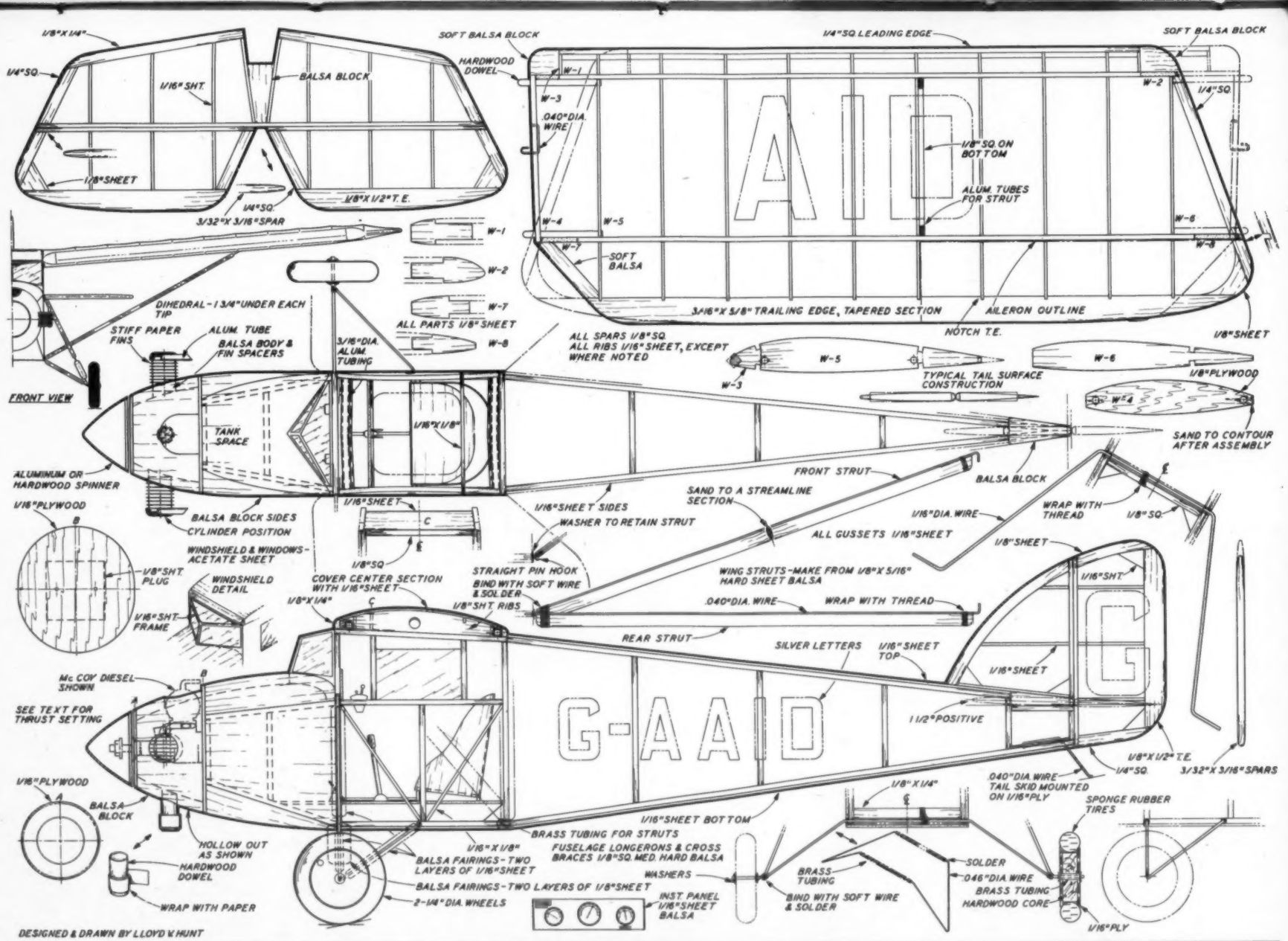
Bend the landing gear and cement in place, using Ambroid or a similar adhesive, and wrap to the fuselage structure. The remaining parts of the fuselage are now covered with 1/16 sheet. Brass tubes are used to retain the struts to the fuselage. The struts are shown in true length. Custom bend the ends to fit the tubes in the wings to obtain the correct dihedral. Wrap and cement the wire contour of the struts to the wood frame. Bend two small hooks from straight pins: these are used to secure the ends of the struts to the fuselage with a rubber band stretched under the fuselage. The details of the wheels may be used, but wooden wheels may also be employed.

The horizontal and vertical tails are constructed according to the plan; then sand to contour. Cover the complete model with Japanese tissue or light Silkspan. The model shown was finished this way: fuselage and vertical tail—one coat of clear dope, three coats of black; cowling, spinner and letters—silver; wings and horizontal tail—one coat of clear dope, three coats of orange thinned out 50 per cent.

Flight adjustment for the model will be approximately 1/32 in. right thrust and a slight amount of washout in both tips. Cut or drill a hole in the bottom of the to remember when learning (*Continued on page 44*)

The "English Robin" can be carried in a small traveling case, thanks to come-apart design. Interior details on plans. That's a Mac Diesel.





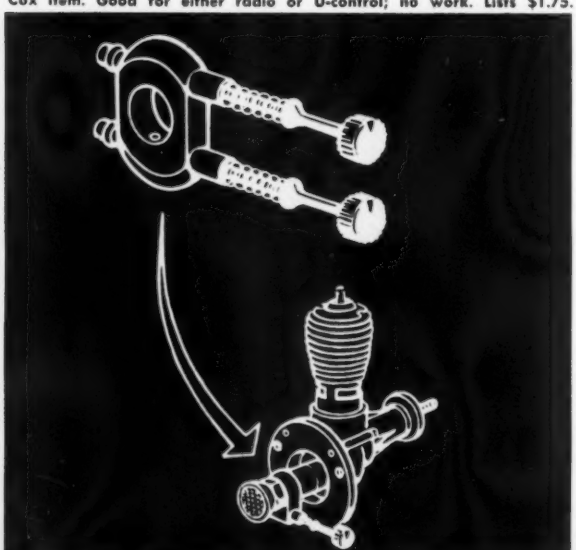
FULL SIZE PLANS AVAILABLE. SEE PAGE 44.

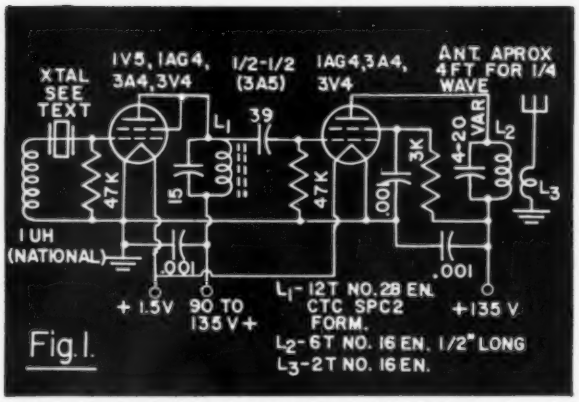
Radio Control News

Duet, a 46 in. bipe, by Ted Strader, a MAN reader for 19 years, has a Cub .149 for power. Uses a modified Lorenz receiver. Rudder-only.

DeBolt's latest is this Piper liaison type original. Span is 67 in., power a Fox .25. Radio own two-channel. Bare weight 50 oz. By servos.

Beautifully made two-speed needle valve system for Space Bug is new Cox item. Good for either radio or U-control; no work. Lists $1.75.





For operation between 50.5 and 53.5 mc (two ships at once!), schematic for transmitter is suggested to those holding a proper license.

By E. J. LORENZ

Rock and roll with radio control. There's plenty here to give you cheer. To be serious, that super expert stuff makes us wearious.

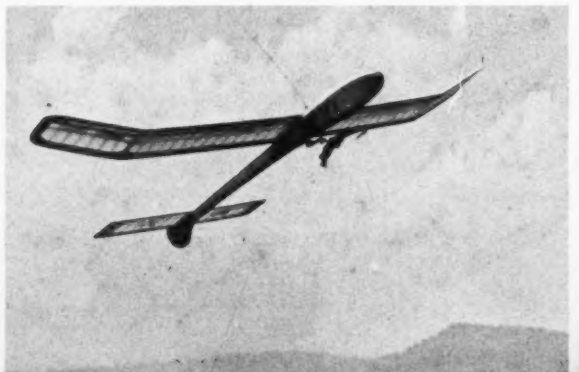
► What kind of soldering iron shall I use? This is a typical question asked not only by the beginner but sometimes by the advanced builder. Since soldering is a vital part of radio and electronic assembly work, it should be given a little more thought than the average builder devotes to it.

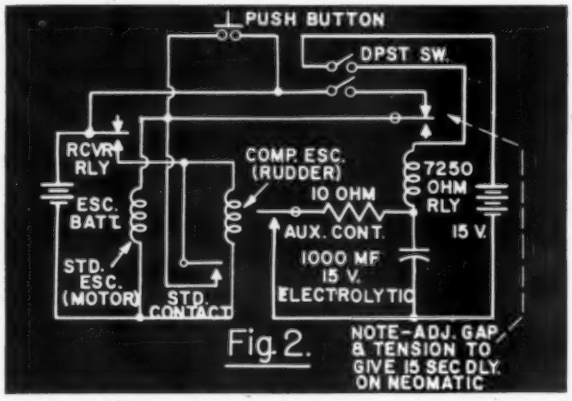
To repeat a wise precaution, do not use an acid core solder or a paste flux when soldering electrical connections.

The iron used should be large enough to heat the work to the point of allowing the solder to flow properly. Too hot an iron will burn the flux and oxidize the metal surfaces. This results in a poor solder joint, which can be as bad as a so-called cold joint.

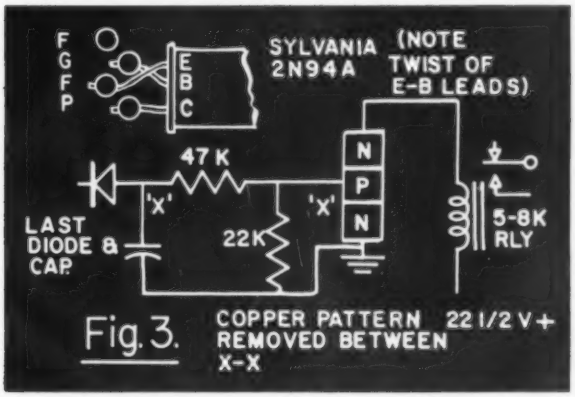
Actually, a variety of soldering operations cannot be performed with only one iron. Average wiring construction requires a medium-sized iron of about 30-35w with about a 3/16 in. diameter tip; printed wiring assembly should be done with a somewhat lighter iron, the wattage being from about 25 to 32, with a ⅛ to 3/16 in. diameter tip. For heavier work, involving soldering to a chassis, etc., the wattage should be from about 40 to 75w with a tip diameter of 3/16 to 5/16 in. These wattage ratings and tip sizes are nominal figures. Ungar pencil type soldering irons, long a favorite for light soldering jobs, now have a complete range of tips from a wattage rating of about 23 up to 47, with a

Remotely controlled soaring glider, above, pix bottom opposite page, through courtesy Swiss Aero Review. Show RC contest in Switzerland.





Fail-safe anti-flyaway device by C. G. Morency, Montreal, shuts off motor if a 15-second period elapses without a signal being sent out.



Schematic from Kelly Day shows how he converted an Aristrol 3D receiver to transistor operation in the second stage. NPN transistor.

variety of tip sizes and shapes. The main feature of these new tips is that they are made of iron instead of copper and are silver-plated. This makes for a longer lasting tip which is more free of scale. Since good soldering depends on *cleanliness,* these new tips are just what the doctor ordered.

The bane of all RC manufacturers is receiving improperly soldered equipment for servicing. Acid core or the paste type of flux has caused corrosion of the metal parts, leakage resistance between parts, especially on printed wiring boards. Too small an iron has caused a cold joint and, usually, a pile-up of solder which does little or no good. Too hot an iron generally ruins the component or causes delamination of the copper pattern in the case of printed wiring.

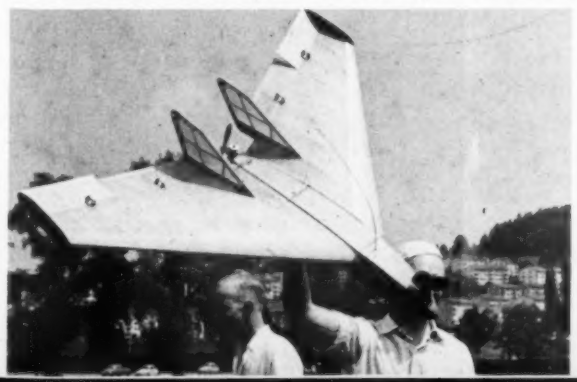
Fig. 1 gives the schematic for a transmitter to be operated in the 50-54mc band. Remember that this band is open only to those who hold the proper license. This was the band generally used for RC work prior to the assigning of 27.255mc for remote control purposes. Last month we gave a schematic of a self-excited oscillator for those qualified to use this band. Here's how the transmitter operates: the oscillator operates at a frequency of from 25 to 27mc, using an overtone crystal (third overtone) in the same manner as the conventional 27.255mc transmitter. This means the crystal should be between 8.334 and 9mc. Tune the oscillator in the usual manner, after which plate voltage may be applied to the amplifier doubler tube. Check the oscillator, using a small 60ma flashlight bulb connected to two ¾ in. diameter turns of wire to be sure the oscillator is still operating.

When the second stage is connected, you will find that retuning of the oscillator is necessary, generally toward the low capacity side of the trimmer. Tune second stage for minimum dip, after which set the tuning capacity on the low side of the dip for maximum stability. This circuit has been used with a wide variety of tubes, including both sections of a 3A5 in place of dual tubes. Crystals were obtained from McCoy Co., Mt. Holly, Pa. Ace Radio Control (Box 301, Higginsville, Mo.) tells us they can also supply crystals for this use. The use of this band by those qualified will help reduce or eliminate congestion on the 27mc spot and will also allow functioning of at least three frequencies between 50-54mc. It is suggested that operation be confined between 50.5mc and 53.5 mc and that receivers be separated by at least 1mc.

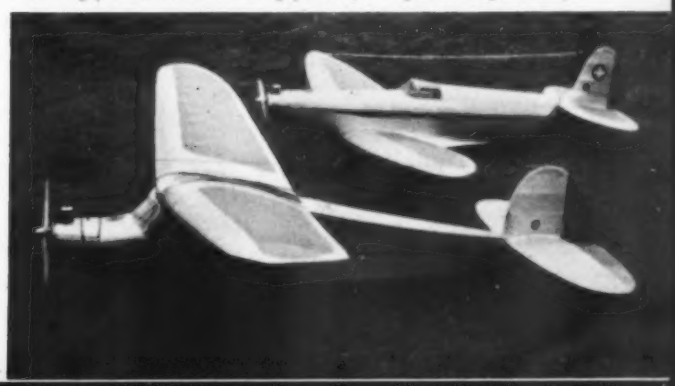
From C. G. Morency, an engineer, 4651 Park Ave., Montreal 8, P.Q. Canada, comes the schematic in Fig. 2. He calls this a non-fly-away safety device for single-channel receiver. The actual safety circuit is not as complicated as the schematic appears, since the primary actuator circuit is also included. The idea of this arrangement is to provide a means whereby everything remains normal, as long as a signal is received at least once every 15 seconds. Should no signal be received through receiver or transmitter failure, or rundown rubber on batteries on the actuator, the engine is cut off, thus minimizing danger of a fly-away.

Parts are conventional with the exception of a modification on a Bonner Compound Escapement, which provides an auxiliary contact that closes between pulses two and three. After no signal has been received for a period of 15 seconds, a time that has been found to be optimum, the 7,250 Ohm Neomatic relay drops out, thus actuating the motor cut-off. If a different type of relay is used, the voltage and/or value of the electrolytic capacity may have to be varied. This sounds like a worthwhile idea and it (*Continued on page 40*)

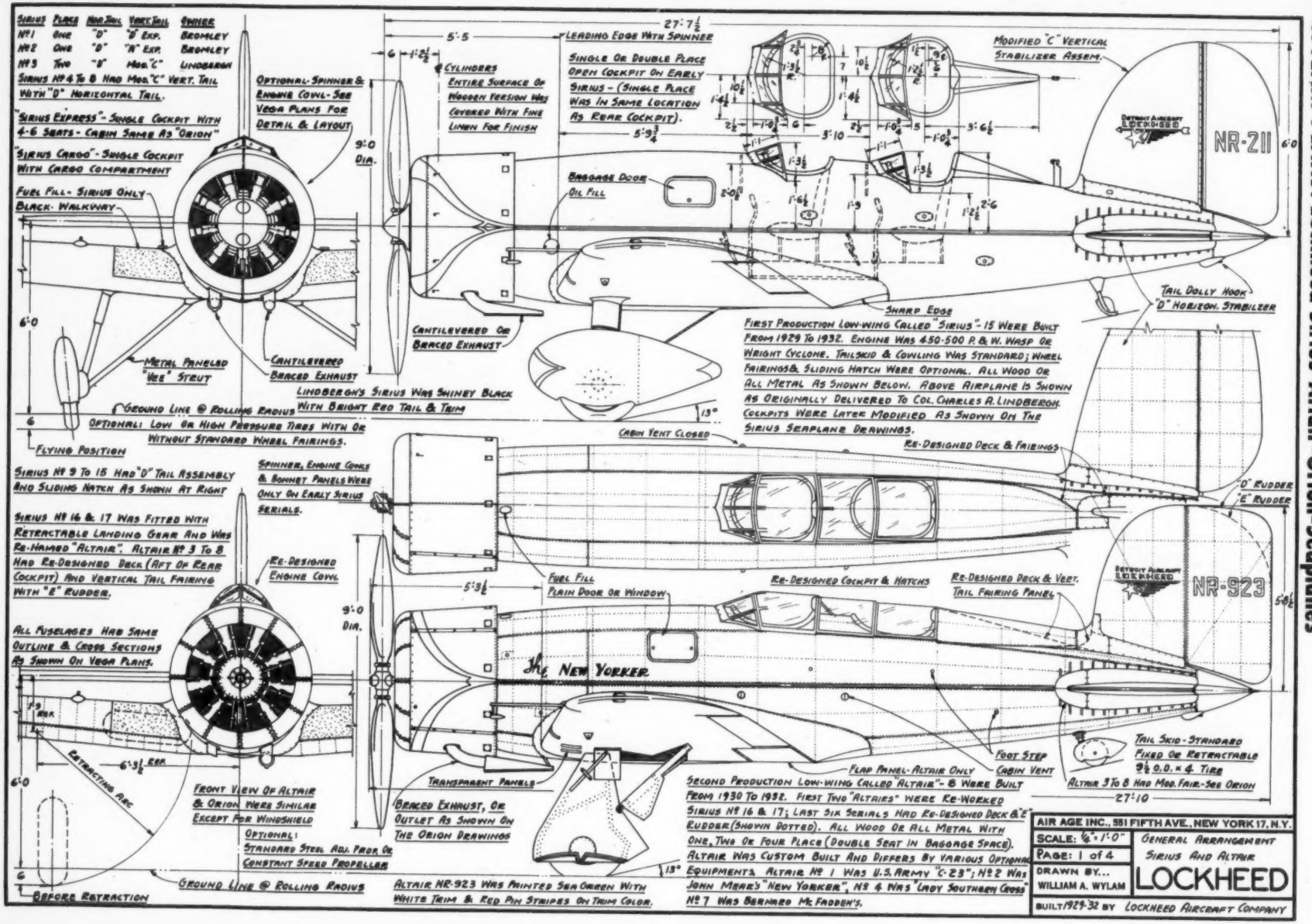
Unique forward finned delta appears to be maneuvered by means—well, how is the thing controlled? By the forward fin? By the tip surfaces?

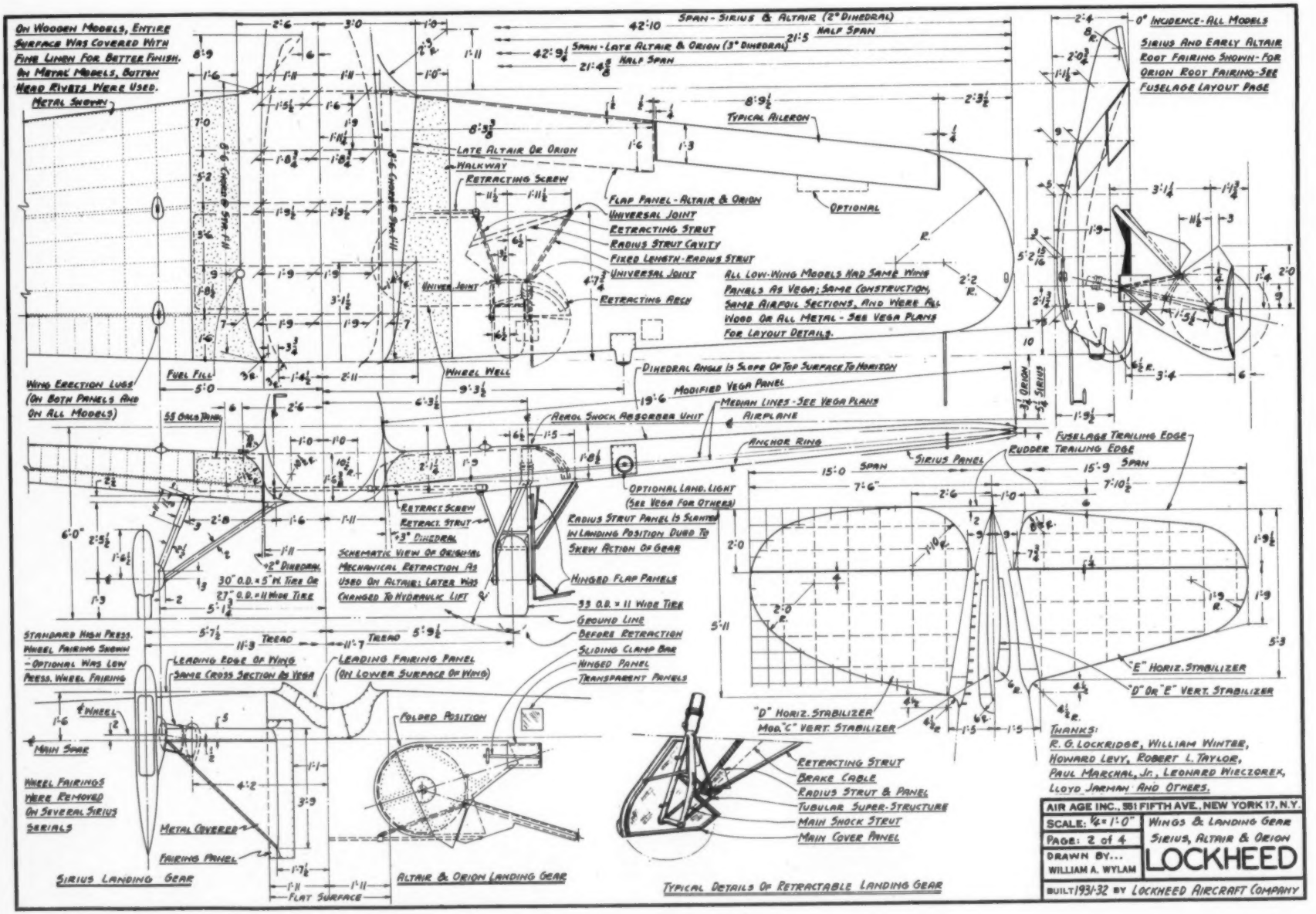


Contrasts in types. Ship in background is Spitfire scale model. With that wing planform and low wing position, it might be toughie to fly.

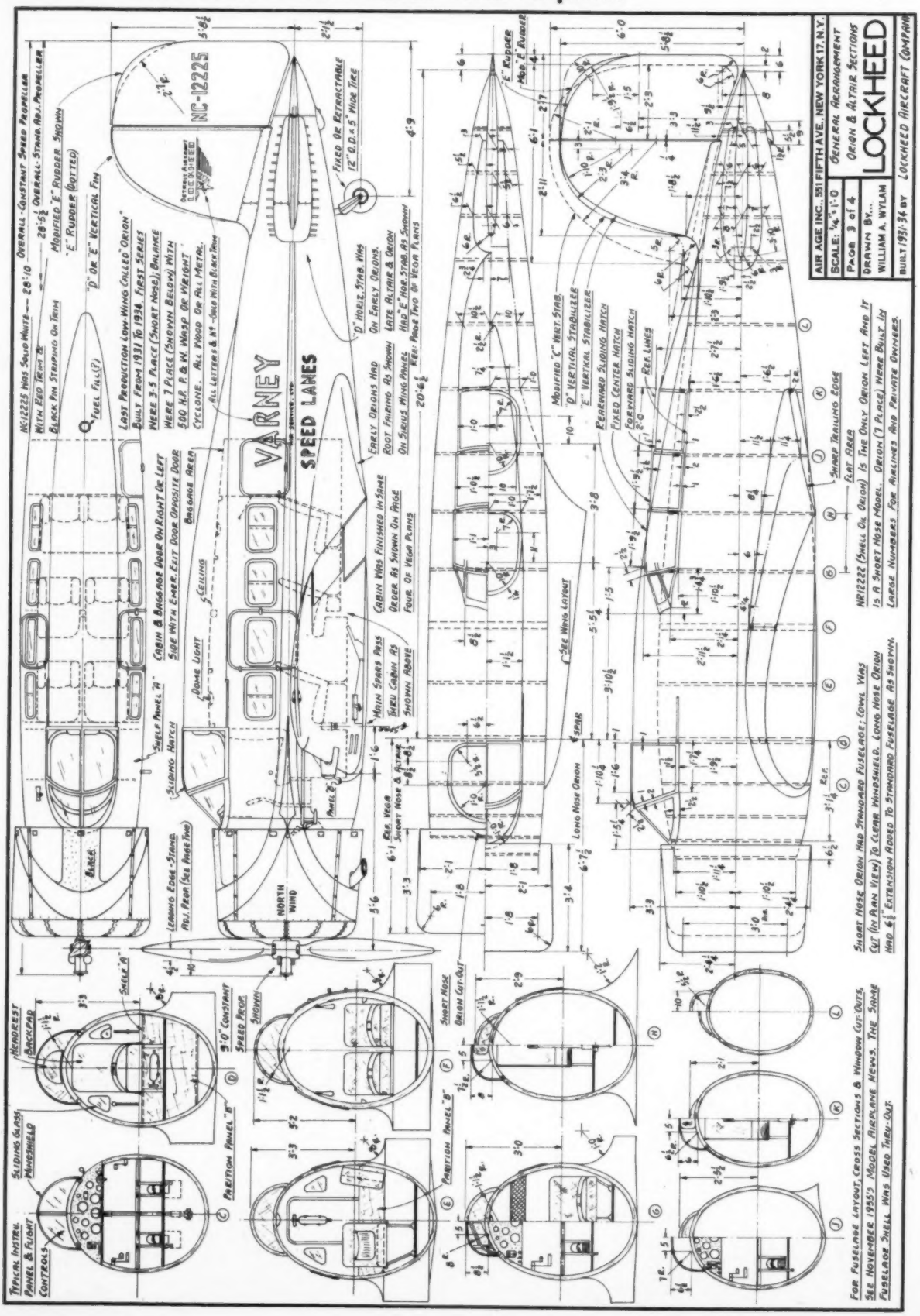


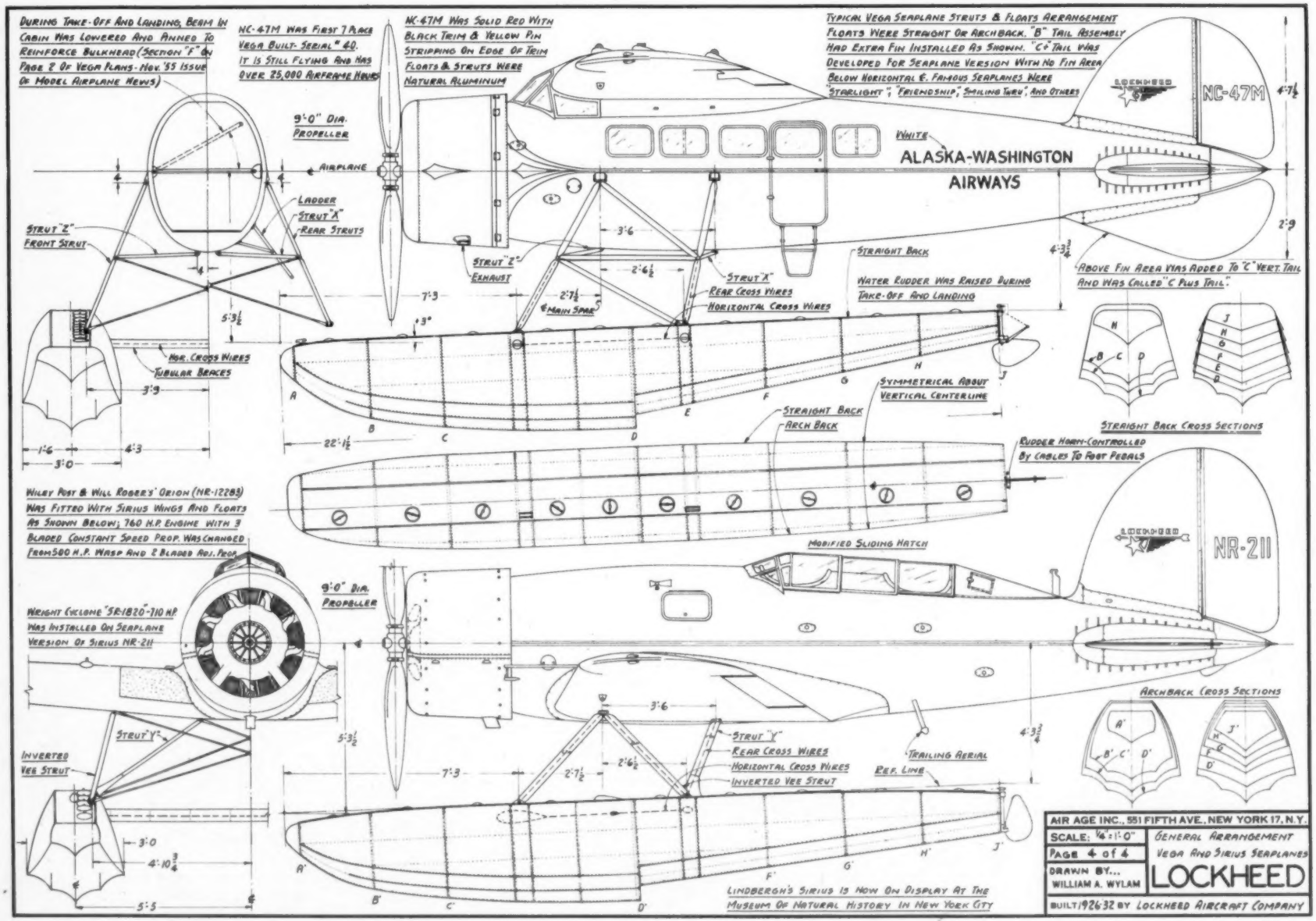
WYLAM PLANS: Lockheed Sirius-Altair-Orion-Seaplanes


Sirius | Place | Hor. Tail | Vert. Tail | Owner
No 1 | One | "D" | "B" Exp. | Bromley
No 2 | One | "D" | "A" Exp. | Bromley
No 3 | Two | "B" | Mod. "C" | Lindbergh
Sirius No 4 To 8 Had Mod. "C" Vert. Tail With "D" Horizontal Tail.
"Sirius Express" - Single Cockpit With 4-6 Seats - Cabin Same As "Orion"
"Sirius Cargo" - Single Cockpit With Cargo Compartment
Fuel Fill - Sirius Only
Black - Walkway
Optional - Spinner & Engine Cowl - See Vega Plans For Detail & Layout
9'0 Dia.
6'0
Metal Paneled "Vee" Strut
Cantilevered Braced Exhaust
Ground Line @ Rolling Radius
6
Optional Low Or High Pressure Tires With Or Without Standard Wheel Fairings.
Flying Position
Sirius No 9 To 18 Had "D" Tail Assembly And Sliding Hatch As Shown At Right
Sirius No 16 & 17 Was Fitted With Retractable Landing Gear And Was Re-Named "Altair". Altair No 3 To 8 Had Re-Designed Deck (Aft Of Rear Cockpit) And Vertical Tail Fairing With "E" Rudder.
All Fuselages Had Same Outline & Cross Sections As Shown On Vega Plans.
Retracting Arc
6'3½ Rad.
6'0
Before Retraction
Ground Line @ Rolling Radius
6
Front View Of Altair & Orion Were Similar Except For Windshield
Optional: Standard Steel Adj. Prop Or Constant Speed Propeller
Spinner, Engine Cowls & Bonnet Panels Were Only On Early Sirius Serials.
Re-Designed Engine Cowl
9'0 Dia.
Transparent Panels
Braced Exhaust, Or Outlet As Shown On The Orion Drawings
Altair NR-923 Was Painted Sea Green With White Trim & Red Pin Stripes On Trim Color.
27'7½
5'5
Leading Edge With Spinner
6
1'2½
Cylinders Entire Surface Of Wooden Version Was Covered With Fine Linen For Finish
Single Or Double Place Open Cockpit On Early Sirius - (Single Place Was In Same Location As Rear Cockpit).
5'9¾
Baggage Door
Oil Fill
Cantilevered Or Braced Exhaust
Lindbergh's Sirius Was Shiney Black With Bright Red Trim & Trim
13°
Modified "C" Vertical Stabilizer Assem.
NR-211
6'0
Tail Dolly Hook
"D" Horizon. Stabilizer
Sharp Edge
First Production Low-Wing Called "Sirius" - 15 Were Built From 1929 To 1932. Engine Was 450-500 P. & W. Wasp Or Wright Cyclone. Tailskid & Cowling Was Standard; Wheel Fairings & Sliding Hatch Were Optional. All Wood Or All Metal As Shown Below. Above Airplane Is Shown As Originally Delivered To Col. Charles A. Lindbergh. Cockpits Were Later Modified As Shown On The Sirius Seaplane Drawings.
Cabin Vent Closed
Re-Designed Deck & Fairings
"D" Rudder
"E" Rudder
NR-923
5'0½
5'3½
Fuel Fill
Plain Door Or Window
Re-Designed Cockpit & Hatchs
Re-Designed Deck & Vert. Tail Fairing Panel
The New Yorker
Foot Step
Cabin Vent
Flap Panel - Altair Only
Tail Skid - Standard
Fixed Or Retractable
9½ O.D. × 4 Tire
Altair 3 To 8 Had Mod. Fair. - See Orion
27'10
Second Production Low-Wing Called "Altair" - 8 Were Built From 1930 To 1932. First Two "Altairs" Were Re-Worked Sirius No 16 & 17; Last Six Serials Had Re-Designed Deck & "E" Rudder (Shown Dotted). All Wood Or All Metal With One, Two Or Four Place (Double Seat In Baggage Space). Altair Was Custom Built And Differs By Various Optional Equipments. Altair No 1 Was U.S. Army "C-23"; No 2 Was John Mears's "New Yorker", No 4 Was "Lady Southern Cross" No 7 Was Bernard Mc Fadden's.
AIR AGE INC., 551 FIFTH AVE., NEW YORK 17, N.Y.
SCALE: ½" = 1'-0"
PAGE: 1 of 4
DRAWN BY... WILLIAM A. WYLAM
General Arrangement
Sirius And Altair
LOCKHEED
BUILT 1929-32 BY Lockheed Aircraft Company


On Wooden Models, Entire Surface Was Covered With Fine Linen For Better Finish. On Metal Models, Button Head Rivets Were Used. Metal Shown
Span - Sirius & Altair (2° Dihedral)
Half Span
Span - Late Altair & Orion (3° Dihedral)
Half Span
Typical Aileron
Late Altair Or Orion
Walkway
Retracting Screw
Optional
Flap Panel - Altair & Orion
Universal Joint
Retracting Strut
Radius Strut Cavity
Fixed Length Radius Strut
Universal Joint
Retracting Arch
All Low-Wing Models Had Same Wing Panels As Vega; Same Construction, Same Airfoil Sections, And Were All Wood Or All Metal - See Vega Plans For Layout Details.
Dihedral Angle Is Slope Of Top Surface To Horizon
Modified Vega Panel
Median Lines - See Vega Plans
Airplane
Aerol Shock Absorber Unit
Anchor Ring
Optional Land. Light (See Vega For Others)
Wing Erection Lugs (On Both Panels And On All Models)
Fuel Fill
Wheel Well
55 Gals Total
Retract Screw
Retract. Strut
3° Dihedral
2° Dihedral
Schematic View Of Original Mechanical Retraction As Used On Altair; Later Was Changed To Hydraulic Lift
Radius Strut Panel Is Slanted In Landing Position Due To Skew Action Of Gear
Hinged Flap Panels
Ground Line Before Retraction
Sliding Clamp Bar
Hinged Panel
Transparent Panels
30" O.D. x 5" W. Tire Or
27" O.D. x 11 Wide Tire
33 O.D. x 11 Wide Tire
Tread
Tread
Standard High Press. Wheel Fairing Shown - Optional Was Low Press. Wheel Fairing
Leading Edge Of Wing Same Cross Section As Vega
Leading Fairing Panel (On Lower Surface Of Wing)
Folded Position
Main Spar
Wheel Fairings Were Removed On Several Sirius Serials
Metal Covered
Fairing Panel
Sirius Landing Gear
Altair & Orion Landing Gear
Flat Surface
Retracting Strut
Brake Cable
Radius Strut & Panel
Tubular Super-Structure
Main Shock Strut
Main Cover Panel
Typical Details Of Retractable Landing Gear
0° Incidence - All Models
Sirius And Early Altair Root Fairing Shown - For Orion Root Fairing - See Fuselage Layout Page
Orion
Sirius
Fuselage Trailing Edge
Rudder Trailing Edge
Sirius Panel
15'-0 Span
7'-6"
15'-9 Span
7'-10½
"D" Horiz. Stabilizer
Mod. "C" Vert. Stabilizer
"E" Horiz. Stabilizer
"D" Or "E" Vert. Stabilizer
Thanks: R. G. Lockridge, William Winter, Howard Levy, Robert L. Taylor, Paul Marchal, Jr., Leonard Wieczorek, Lloyd Jarman And Others.
AIR AGE INC., 551 FIFTH AVE., NEW YORK 17, N.Y.
SCALE: ¼" = 1'-0"
PAGE: 2 of 4
DRAWN BY... WILLIAM A. WYLAM
WINGS & LANDING GEAR
SIRIUS, ALTAIR & ORION
LOCKHEED
BUILT 1931-32 BY LOCKHEED AIRCRAFT COMPANY

WYLAM PLANS: Lockheed Sirius-Altair-Orion-Seaplanes




During Take-Off And Landing, Berth In Cabin Was Lowered And Armed To Reinforce Bulkhead (Section "F" On Page 2 Of Vega Plans - Nov. '55 Issue Of Model Airplane News)
NC-47M Was First 7 Place Vega Built - Serial # 40. It Is Still Flying And Has Over 25,000 Airframe Hours
NC-47M Was Solid Red With Black Trim & Yellow Pin Stripping On Edge Of Trim Floats & Struts Were Natural Aluminum
Typical Vega Seaplane Struts & Floats Arrangement
Floats Were Straight Or Archback. "B" Tail Assembly Had Extra Fin Installed As Shown. "C" Tail Was Developed For Seaplane Version With No Fin Area Below Horizontal ℄. Famous Seaplanes Were "Starlight", "Friendship", "Sailing Two", And Others
9'-0" Dia. Propeller
Airplane
Ladder
Strut "X" Rear Struts
Strut "Z" Front Strut
Hor. Cross Wires
Tubular Braces
Strut "Z" Exhaust
Main Spar
Strut "X"
Rear Cross Wires
Horizontal Cross Wires
White
ALASKA-WASHINGTON AIRWAYS
NC-47M
Straight Back
Water Rudder Was Raised During Take-Off And Landing
Above Fin Area Was Added To "C" Vert. Tail And Was Called "C Plus Tail."
Straight Back Cross Sections
Symmetrical About Vertical Centerline
Straight Back
Arch Back
Rudder Horn-Controlled By Cables To Foot Pedals
Wiley Post & Will Rogers' Orion (NR-12283) Was Fitted With Sirius Wings And Floats As Shown Below; 760 H.P. Engine With 3 Bladed Constant Speed Prop. Was Changed From 580 H.P. Wasp And 2 Bladed Adj. Prop.
Modified Sliding Hatch
NR-211
9'-0" Dia. Propeller
Wright Cyclone "SR-1820"-710 H.P. Was Installed On Seaplane Version Of Sirius NR-211
Archback Cross Sections
Strut "Y"
Inverted Vee Strut
Strut "Y"
Rear Cross Wires
Horizontal Cross Wires
Inverted Vee Strut
Trailing Aerial Ref. Line
Lindbergh's Sirius Is Now On Display At The Museum Of Natural History In New York City
AIR AGE INC., 551 FIFTH AVE., NEW YORK 17, N.Y.
SCALE: 1/4" = 1'-0"
General Arrangement
Page 4 of 4
Vega And Sirius Seaplanes
Drawn By... William A. Wylam
LOCKHEED
Built 1926-32 By Lockheed Aircraft Company

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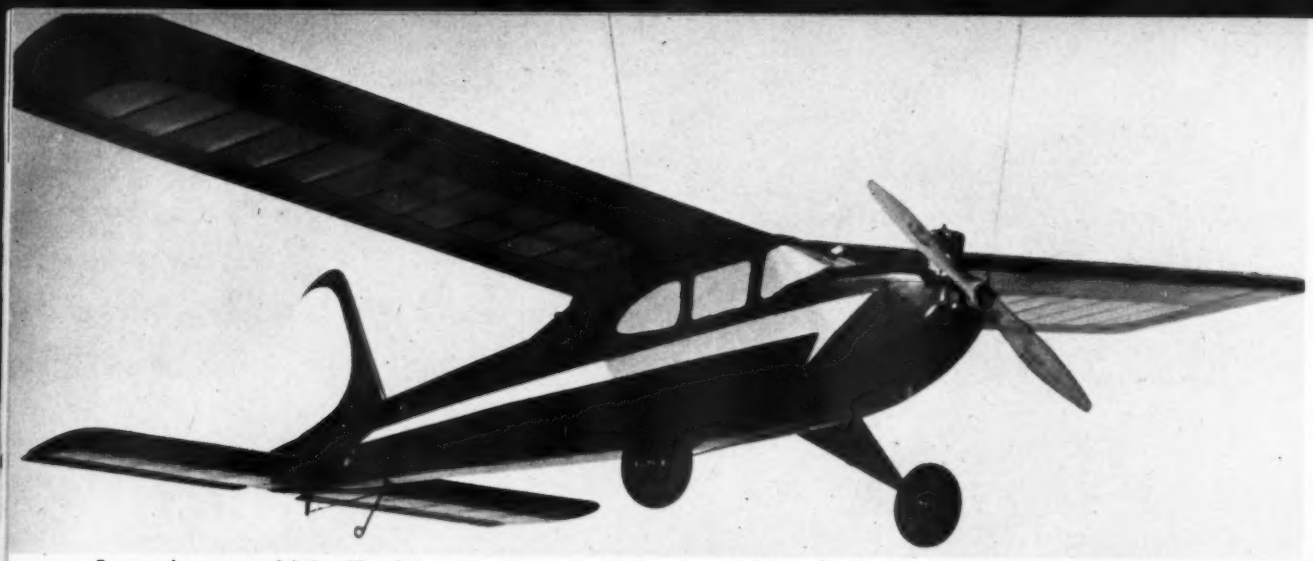
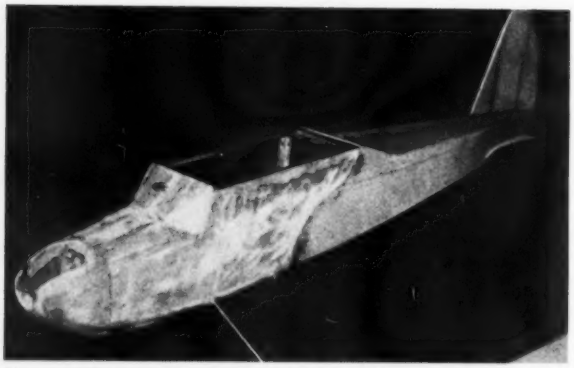
FORMULA "A" *extra-fast-drying* for quick, easy construction of lightweight models and for on-the-spot repairs. Guaranteed Hot Fuel Proof.

FORMULA "B" *fast-drying;* the *strongest* for balsa or hardwood . . . for metal to metal . . . for metal to wood . . . for all general work.



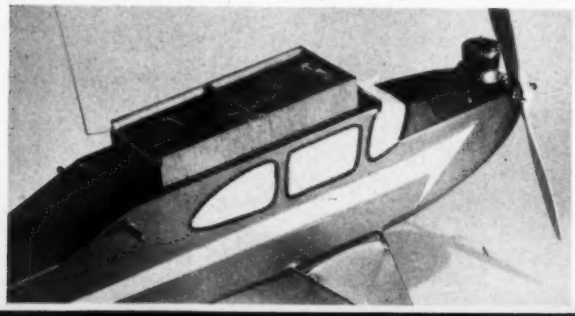
Two or three coats of balsa filler, followed by three coats of clear dope and two of colored, are just right for the silk covering on Blitzen.

With the CG test fleet of airplanes is Don Yearout, left, and CG's general manager, Frank Hoover. Blitzen in the front row, extreme right.



If you want to use Fibreglas for added strength, as shown on treated area in this picture, the fuselage front end will be indestructible.

Removable receiver box is optional. Box does make easy troubleshooting and interchange equipment from plane to plane. That's a help.



Blitzen . . .

By DON YEAROUT

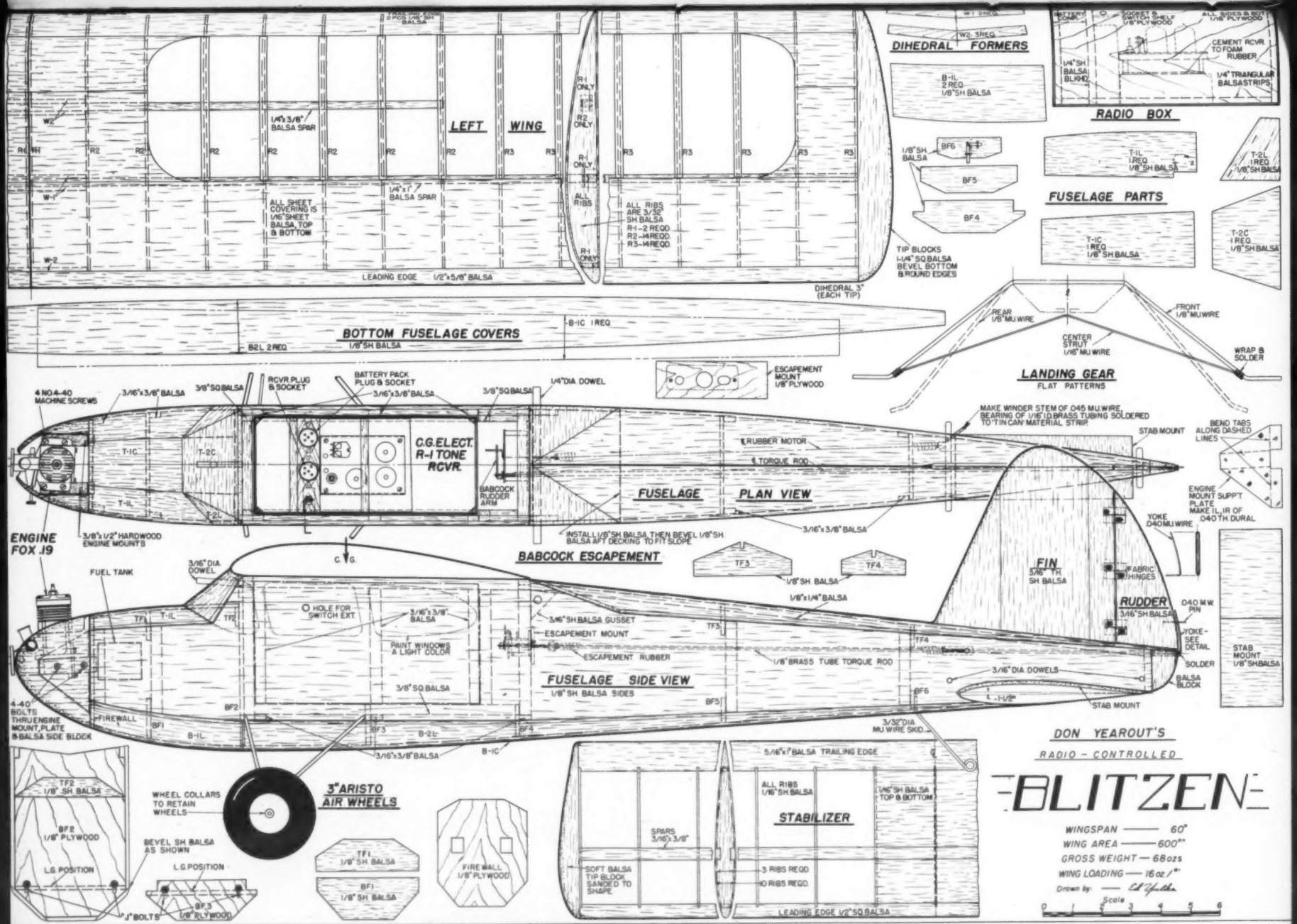
Is it realism and good looks you want in a cabin RC? Then, brother, look no farther.

► Blitzen was originally designed as a flying test jig primarily for new radio control equipment for my employer, the CG Electronics Corp. of Albuquerque, N.M. I was given the job of designing and building an all-purpose test plane—so, out came the drawing board and here's the result.

Blitzen has many desirable characteristics, some of which are strong, light and fairly simple construction, ability to carry a great variety of loads without noticeably disturbing the flight characteristics, and excellent wind penetration which, although increasing the speed of the plane somewhat, permits flying in breezes which would ground many models.

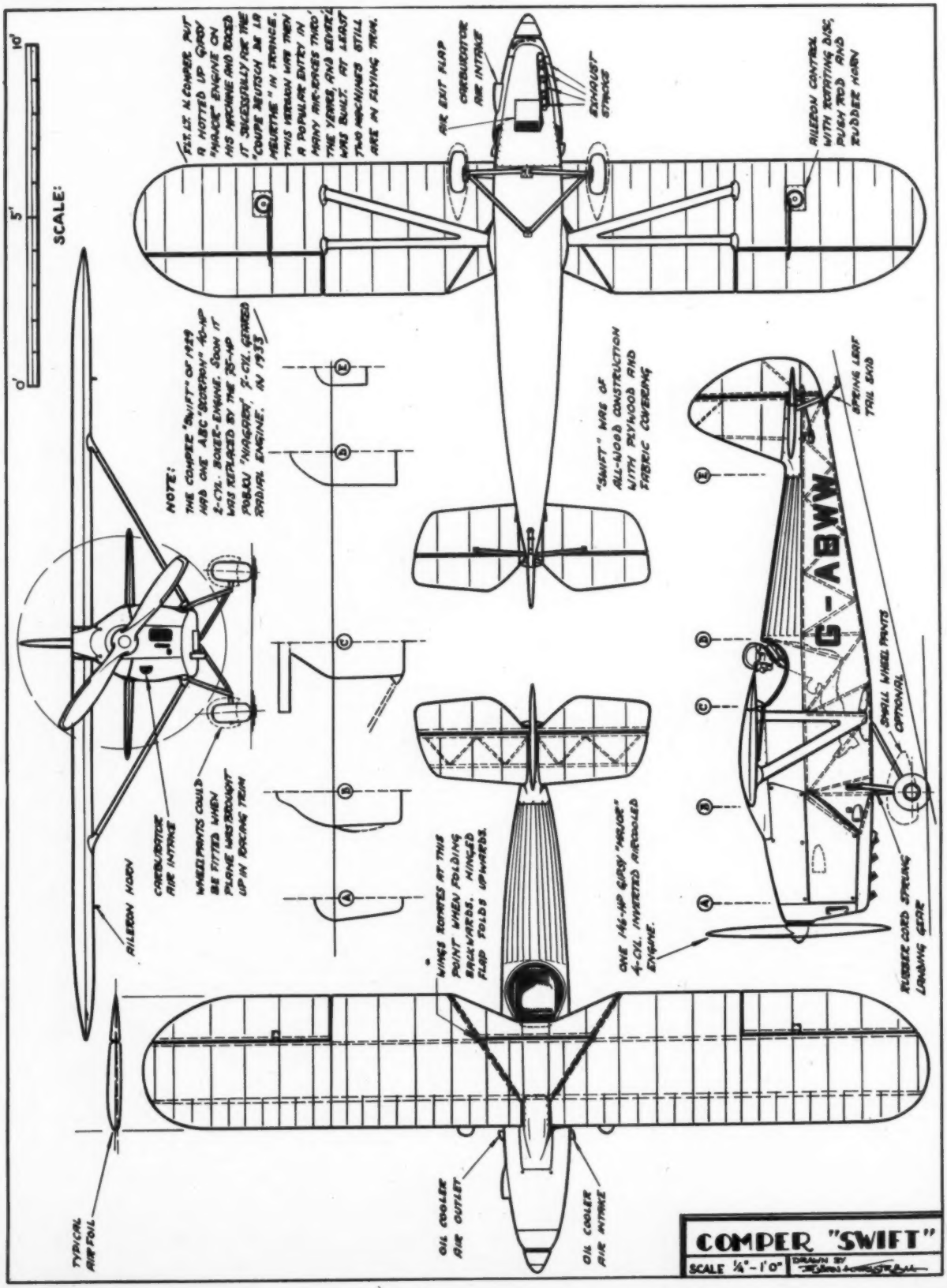
When Fibreglas covers the nose section, the crash-resistance of Blitzen must be seen to be appreciated. Powerplant size is not very important, with .15 to .19 displacement engines serving most purposes, although one early model was pulled around by a Torp .35, meriting the name Lightning.

Let's start construction with the wing. First, the main (front) spar is made of ¼ x 1 in. hard balsa and notched every 2 in. along the total length ½ in. down from the top and 3/32 in. wide. Cut out all 30 ribs, noting that the rear spar hole is omitted from 14 of them. Begin construction of the wing by pinning down the 1/16 x 3 in. leading edge bottom sheeting directly over the wing plan. The 1/16 x 1 in. lower TE, 1/16 x ¼ in. bottom cap strips and bottom tip sheeting are pinned down and cemented together. The main spar is then cemented in place with the notches toward the top. The wing ribs are installed next, followed by LE and rear spar. Both wing halves are finished to this point and then joined with the plywood gussets and plenty of cement. When thoroughly dry, the wing is ready for the top LE and TE sheeting, top cap strips, tip and center sheeting. Add the wing tip (*Continued on page 37*)



FULL SIZE PLANS AVAILABLE. SEE PAGE 44.

Planes Worth Modeling—COMPER SWIFT


SCALE:
0'
5'
10'
NOTE:
THE COMPER "SWIFT" OF 1929 WAS ONE ABC "GOSPEL" 90-HP 6-CYL. BOXER-ENGINE. SOON IT WAS REPLACED BY THE 75-HP POBJOY "NIMBUS" 7-CYL. GEARED RADIAL ENGINE. IN 1933
FIT. LT. N. COMPER PUT A HOTTED UP GIPSY "MAJOR" ENGINE ON HIS MACHINE AND RACED IT SUCCESSFULLY FOR THE "COMPE NEUTRON" IN FRANCE. THIS VERSION WAS THEN A POPULAR ENTRY IN MANY AIR-RACES THRO' THE YEARS, AND SEVERE WAS BUILT. AT LEAST TWO MACHINES STILL ARE IN FLYING TRIM.
AIR EXIT FLAP
CARBURETTOR AIR INTAKE
EXHAUST STACKS
AILERON CONTROL WITH ROTATING DISC, PUSH ROD AND RUDDER HORN
"SWIFT" WAS OF ALL-WOOD CONSTRUCTION WITH PLYWOOD AND FABRIC COVERING
SPRING LEAF TAIL SKID
G-ABWW
SMALL WHEEL PANTS OPTIONAL
RUBBER CORD STRUNG LANDING GEAR
ONE 145-HP GIPSY "MAJOR" 4-CYL. INVERTED AIR-COOLED ENGINE.
WINGS FOLDED AT THIS POINT WHEN FOLDING BACKWARDS. HINGED FLAP FOLDS UPWARDS.
WHEEL PANTS COULD BE FITTED WHEN PLANE WAS BROUGHT UP ON ROCKING TRIM
CARBURETTOR AIR INTAKE
AILERON HORN
TYPICAL AIR FOIL
OIL COOLER AIR OUTLET
OIL COOLER AIR INTAKE
COMPER "SWIFT"
SCALE ¼"-1'0"
DRAWN BY

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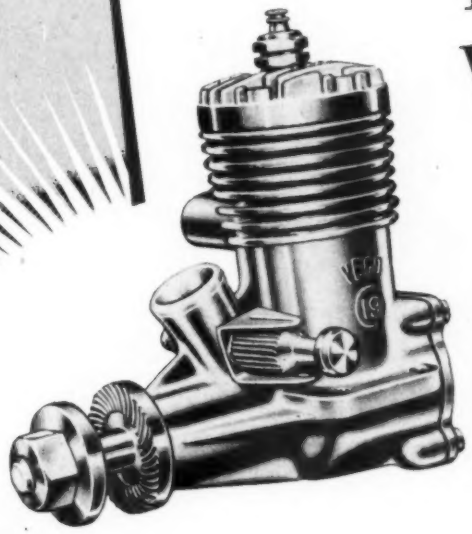

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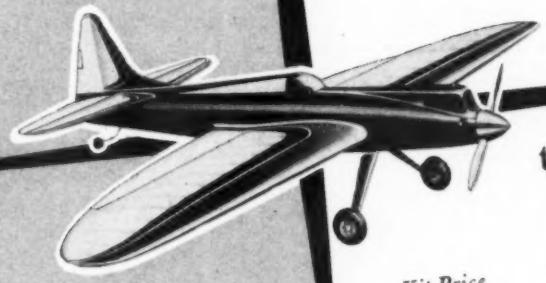

the Veco THUNDERBIRD

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1955 National and Jr. Stunt Champion and California State Stunt Champion. Designed and Flown by Bob Palmer, who says, "This Model, with the Veco .35 Engine, is the Greatest Performing Combination I have ever flown."

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NEW! OS-MAX-I 35

9 Reasons why the new OS Max-1-35 (MAXIE) cannot be compared with any 35, foreign or domestic. The MAX-1-35 by OS is a brand new 1955 model—new from the ground up—not to be confused with the early OS 29 or 36.

1. The OS MAX-1-35 has terrific porting—and features two additional piston by-pass ports in addition to the lower sleeve entry — a feature usually found only in the $25.00 to $35.00 racing engines.
2. The OS MAX-1-35 comes with nice rubber dust covers for BOTH exhaust and venturi. An exclusive feature to date.
3. The flex-needle is another custom feature.
4. The "Maxie" has its venturi polished and comes with two inserts giving three combinations.
5. Sandblasted crankcase and many exterior finishes make MAX the "Engine of Distinction".
6. Highest bore stroke ratio—our tests indicate that the OS MAX-1-35 has no equal for all out urge—power.
7. Each OS MAX-1-35 is factory broken in to the point that it can be installed directly into the plane.
8. ALL OS MAX-1-35 parts adequately stocked, all service, by WORLD ENGINES right here in the U.S.A.
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OS Max 1—35 Stunt	$11.95
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OS Max 1—15 2-speed	11.95
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Webra Mach 1 .15 Ball Brg.	13.95
Webra Winner .15 Beam—9.95 Flange	9.95
Webra Winner .15 2-speed, Bm. & fl.	12.50
Webra Record .09 Bm. & fl.	8.85
Webra Piccolo .049 Incl. Tank & Prop	7.85
David-Andersen .15	15.95
David-Andersen .06	10.95
Oliver Tigre Mk-3 Ball Brg. .15	24.95
Oliver Tigre Cub Ball Brg. .09	22.50
Elfin BR .09 Ball Brg. "REED"	15.95
Elfin BR .15 Ball Brg. "REED"	16.95

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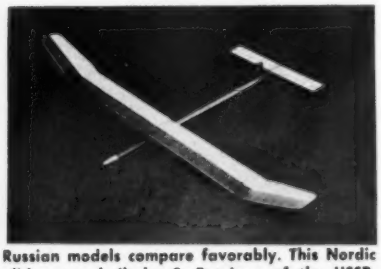
P. G. F. CHINN

FOREIGN NOTES

A monthly world-wide round-up of technical developments, designs, significant industrial products.

Great Britain: New World Record Speed Claim

During the recent big one-day All-Britain meet at the Handley-Page airfield, 15 miles out of London, "Gadget" Gibbs, noted English speed flier, made a successful attempt on the FAI Class II (5 cc: .30 cu. in.) speed record. Subject to ratification, the new mark is 146.21 mph. Motor used was a special built by Fred Carter. The model was of fairly conventional layout, the motor being neatly cowled but with exposed head. No separate vertical fin was used. It weighed 15½ oz. and used a pen bladder tank.



Russian models compare favorably. This Nordic glider was built by S. Botvinov of the USSR.

Soviet Internationals

The annual Soviet-sponsored International meeting was held this year in Czechoslovakia. Eight nations took part, as last year, but the current meet saw the inclusion of Yugoslavia in place of the Ukraine. Winning country on over-all performance was Hungary. In second place Czechoslovakia, followed by the Soviet Union with third, Yugoslavia fourth, Rumania fifth, East Germany sixth, Bulgaria seventh and Poland eighth.

As last year, the events comprised five classes: glider, rubber, free flight power, 2.5 cc speed and jet speed. The glider (A.2) event was won by Hungary with Czechoslovakia second and Yugoslavia third, followed by Rumania, USSR, East Germany, Bulgaria and Poland. Russia won the rubber event with Yugoslavia second and Hungary third, followed by East Germany, Poland, Rumania, Czechoslovakia, Yugoslavia, East Germany, Rumania, Russia, Hungary, Poland and Bulgaria. The Czechs, not surprisingly, also won the 2.5 cc speed, with Hungary second and the Soviet Union third, followed by Yugoslavia, Rumania, East Germany, Bulgaria and Poland. Finally, the jet event resulted in a victory for the Russians (present world record holders) followed by Hungary, Rumania, Czechoslovakia, Bulgaria, Yugoslavia, East Germany and Poland.

The method of scoring the speed events was unusual. Using the current FAI record marks as targets, contestants were placed according to the percentages realized. Winning percentages were 94 per cent in the 2.5 cc class (i.e., 111 mph) and 92 per cent in the jet class (157 mph).

Israel Nationals

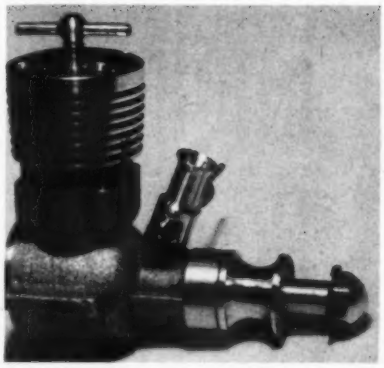
The official body controlling model activities in Israel is the Aeromodeling Section of the Aero Club of Israel, formed in 1949. Its present chairman is Naftali Kadmon of Jerusalem who, for the past two years, has been Israeli National Champion. The 1955 Israeli Nationals was a five-day event and about 100 modelers, with 124 models, from 20 different clubs, took part. This may not seem large by U.S. standards, but Mr. Kadmon points out that it actually represents one entry per 13,000 of the country's population and that this is actually about four times the representation at the latest U.S. Nationals.

Gliders have always been popular in Israel and we remember some striking examples produced in Tel-Aviv seen before the war. In the A.2 Class there were 42 entries, almost all of them being original designs featuring modern thin airfoil sections, and the event was won by Ze'ev Ben Shahar. The Nordic A.1 Class glider is also popular (52 entries) and this was won by Rami Levi. Both winners were in the Israeli team at the 1954 World Glider Championships event in Denmark. Motors are not too plentiful in Israel and the free flight event was won by Nissim DeKalo using a German Taifun Hobby Diesel, with Elfin 2.49 and ED Bee-powered jobs second and third.

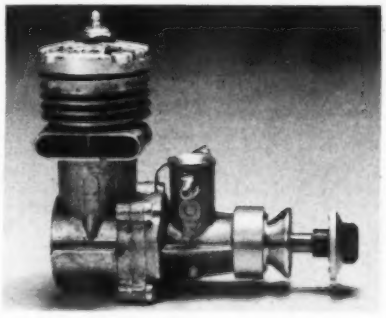
First foreign outboard is the new Italian Super Tigre .049. It is rugged, well-engineered.

Holland: Interesting New Relay

From the Minatuur-Motorenfabriek Typhoon of Amsterdam we have received an example of a new relay which is to be marketed in the various countries to which Typhoon motors and RC equipment are exported. Built on a substantial base, making it suitable for separate mounting where desired, the unit is well made and has adjustable spring tension and adjustable contacts. Contact points are silver and contact arms are cadmium-plated brass. Weight is 1.2 oz. and dimensions are 1.85 x 1.4 x .8 in. The relay has a nominal coil resistance of 5,000



World Championships winners, 1955, were, top, English Oliver .15 Tiger in free flight and Italian Super Tigre lapped piston .15, speed.



ohms and a check on our sample gave a reading very close to this figure at 4,800 ohms.

Italy: Super-Tigre Outboard

We now have one of the new Super-Tigre .049 outboards. First model outboard to be produced outside the U.S.A., the Super-Tigre is an exceptionally well-engineered job. Final drive is via an oil-filled bevel gearbox in a bronze housing. Unit is really rugged, with strong transom mounting and swivel bracket and weighs 6.9 oz. complete. Power head features glow filament built into the cylinder head.

Japan: RC Getting Established

Following our earlier notes regarding the entry of the Japanese Ogawa Model Manufacturing Co. into the radio control market, we have now received details from the manufacturer of the actual production outfit, which is to be known as the OS Minitron. This comprises the Type 1A receiver and Type 1AP-100 transmitter for operation on the 27 mc band. The receiver uses a conventional hard-tube circuit, with 3Q4 tube and operates on a 67.5 volt B supply. It is housed in a neat plastic case measuring 2⅜ x 1⅞ x 1-7/32 in. The transmitter employs a single 3A5 tube and is built into a plastic case which also houses the batteries (135 volt B supply). The on-off switch and keying switch are mounted on the front panel.

From Japan, also, comes a picture of a Live-Wirish-looking radio job built by one of the OS employes. Using an OS receiver and OS Max .15 motor, the model has a span of 51 in. and scales 49 oz. Wing area is 465 sq. in.

England: New Frog .15 Motor

We have just been conducting tests on a new Frog International Class motor. First entirely new Frog motor for a number of years, this is a high-speed, twin-ball

(Continued on page 53)

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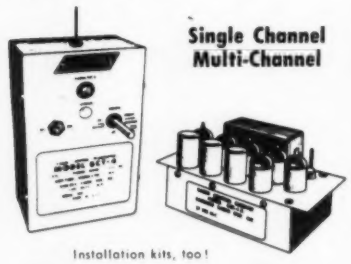

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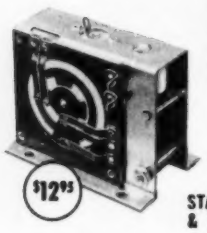

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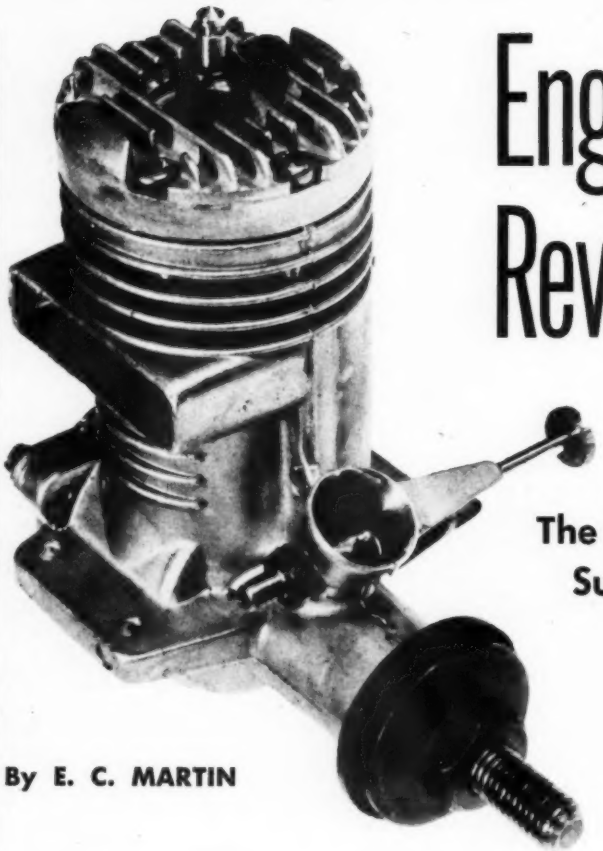
Engine Review



The M.S. FOX Super .29

By E. C. MARTIN

Hopped-up engines hit market. This one a team racing special.

► When a man wins 11 team races in a row on top of 48 straight heats with the same engine and aircraft, people begin to get agitated. There are whispers of special equipment and military secrets and the perpetrator of such an embarrassing record of successes becomes almost morally obliged to clear his enviable reputation of such innuendos.

This is the background that put modeler George Moir (Model Motors Service) of Mantua, N.J. into the engine business. His friends more or less told him it was his duty to society and it would be hard to think of a more worthy reason. The story therefore goes like this: performance created demand; demand created business.

This is not big business, with large capital invested. It is simply a case of a diligent modeler's finding out some engine facts during long evenings in the cellar, proving their worth on the field and then going in a hole for equipment to enable him to pass on those hard-won facts to his fellow modelers. It is by no means certain that George will get back what he has put into this spare time enterprise and indeed, the history of such ventures is against him. So take this at its face value: by intelligent high quality reworking of Fox engines, Model Motors Service is able to offer you team racing engine performance and economy that appreciably surpass anything in this writer's experience—and without any apparent sacrifice of other desirable qualities. Now for the details.

Every surface in the M.S. Fox that is exposed to the movement of fuel or gases is polished to a mirror finish. The air enters a polished intake passage, draws fuel past a polished jet needle, enters a polished crankshaft passage and flows into a polished crankcase where it circulates around a polished crank disc and end cover and is agitated by a shiny conrod. From there it rushes through a polished bypass into a polished combustion chamber, is burned, and the waste products expelled from a polished exhaust stack. The fact that you are tired of reading the word polished is an indication of the work involved in but one phase of the super-tuning process.

In all the spheres of engine interest in cars, boats and planes, large and small, there are people to be found polishing and porting and, in nine cases out of ten at least, they are making a ghastly mess of either a perfectly good engine or flogging a dead horse that above all needs a rebore and pistons. Polishing runs the gamut from a collection of clumsy gouges with a hand grinder, and radii where there should be corners, to a meticulous and laborious job of intelligent mirror finishing with no slips. The moral is, of course, never to attempt polishing unless you have the time and extreme patience to do it properly and, if it seems a kind of elementary thing to be paying money for, just try it on an old engine and convince yourself.

Most of the modifications in this engine are directed toward improving volumetric efficiency or breathing capacity by reducing internal fluid friction, as distinct from improving it by altering port timing. The latter method results in a gain at the top of the rpm scale and a loss at the bottom with an increase (*Continued on page 46*)

Blitzen . . .

(*Continued from page 30*)

blocks, TE reinforcing wire, trim any rough edges, sandpaper completely and cover. Silk or nylon covering is recommended but Silkspan may be used, if desired.

The stabilizer can be built quickly. Cut out all ribs, noting that the three center ribs are a different size. Pin lower spar down on the plan and cement the ribs to it in the appropriate positions. Install the upper spar, LE and TE, tip blocks and center sheeting. Elevators may be added, if desired; 20 sq. in. of movable surface has proved to be about the right amount.

With the fuselage comes the fun. The fuselage is constructed mainly of ¼ in. sheet balsa with silk or nylon covering for extra strength. Begin by tracing the side pattern outline (indicated by the heavy line in the side view) on a sheet of ¼ x 4 in. balsa. Notice the splice line near the top. Cut out two of the sides, using two pieces of sheet balsa that are medium hard and free of warps. Next, indicate on the cut-out sides the positions of the 3/16 x ¾, ¾ x ¾ and ¼ x ¾ in. uprights by tracing or punching a pin through the plan in appropriate places. Now cement the uprights to the side pieces, being sure you make both a right and a left side. Now, cut six 3/16 x ¾ in. pieces, 3¾ in. long, and fasten the two side pieces together with them at stations B2, B3 and B4 on the fuselage side view. Be sure everything is square and cement well.

After drying, pull the tail end together and cement with a piece of ¾ in. square between the sides beveled to fit flush. Now add the rest of the fuselage cross-pieces. Trace the fuselage formers onto ¼ in. sheet balsa and ¼ in. plywood and cut out. Build the engine mount onto the firewall before installing the firewall into the fuselage. Similarly, the landing gear is mounted on BF2 and BF3 before they are installed into the fuselage. Then cement in the rest of the formers and stabilizer platform. B1C and both B2L pieces are put on next, in that order. Notice that the edges are beveled before attaching the B2L pieces. Install the fuel tank of your choice in the correct position and test for leaks. T1C goes on next, followed by both T1L pieces. Then the windshield or T2C and T2L pieces are added. TF3 may also be installed now but T3 sections should be left off until control torque rods or actuators have been installed.

At this time, you must decide whether you will mount the receiver equipment directly in the plane or in a removable box. Although the box adds a little weight to the plane, it gives the receiver a great deal of crash protection and also makes it handy for changing receivers and wiring. If the box is used, it should be made to fit tightly into the fuselage to avoid damage from engine vibration. Since wiring differs with each type of radio installed, no realistic general diagram can be prepared.

After torque rods or their equivalent have been installed, strongly cement in both T3L pieces and rudder. Next, cement the scrap balsa tail fairing and block balsa around nose. Carve off all excess balsa and sand thoroughly. If the fuselage is covered with silk or Silkspan after a few coats of clear dope, its strength will be greatly increased. If Fiberglas covering extends back to the wing TE, the model will be practically indestructible. The enhanced strength amply compensates for the slight additional weight. Of course, you may "dress up" the model by painting in windows in white and by covering with silk or 1/16 in. plywood the area between the front and rear landing gear struts.

(*Continued on page 40*)

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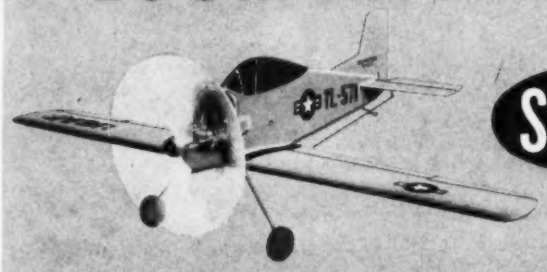

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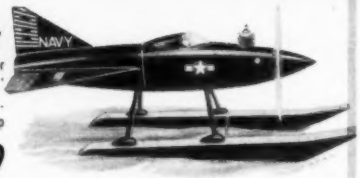

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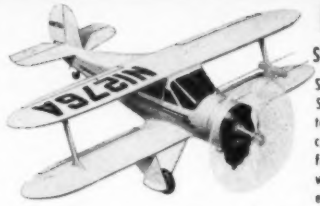

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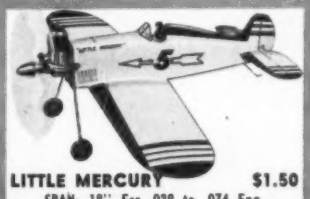
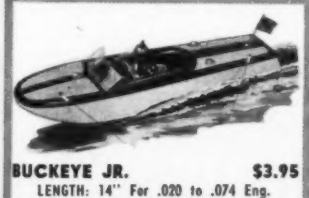
SPAN: 18" For .020 to .074 Eng.
Good U-Control performer at a remarkably low price. Completely prefabbed kit. Easy to fly.



LITTLE MERCURY $1.50
SPAN: 18" For .039 to .074 Eng.
U-Control carved fuselage model. It's completely prefabbed. A cinch to assemble.

CESSNA "180" $1.50
SPAN: 18" For .035 to .074 Eng.
Scale model of world-famous private plane. An excellent sport flyer. Prefabbed.



BUCKEYE JR. $3.95
LENGTH: 14" For .020 to .074 Eng.
A "beaut" of a speedboat. Prefabbed with a carved balsa hull, brass fittings, etc.

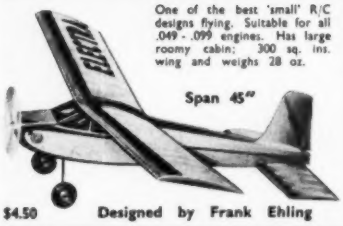
C. C. SPECIAL $3.50
For "½A" Eng. or Electric Motors
Popular Chris-Craft runabout . . . all prefabbed, carved 12" balsa hull,, metal fittings.

BUCKEYE JR. CABIN $3.95
For "½A" Eng. or Electric Motors
Here's our sleek cabin cruiser, with a removable cabin, 14" carved balsa hull, etc., etc.

XP-300 DREAM BOAT $1.95
"½A" Eng., CO_2, or Elec. Motors
Our exclusive aeronautical design. Prefabbed model has 12" carved balsa hull, etc., etc.

SCIENTIFIC MODEL AIRPLANE CO., 113 M2 MONROE ST., NEWARK 5, N. J. IF NO DEALER IS AVAILABLE ADD 10c (POSTAGE & PACKING) TO COST OF MODEL.

R/C IS EASY—WITH JASCO'S ELECTRA!



One of the best 'small' R/C designs flying. Suitable for all .049 - .099 engines. Has large roomy cabin; 300 sq. ins. wing and weighs 28 oz.

Span 45"

$4.50 Designed by Frank Ehling

HAWK

Both 25" Span

TWO SNAPPY JASCO RUBBER MODELS

75c Each

FALCON

When it comes to choosing a rubber kit, you can't do better than the high-wing HAWK or low-wing FALCON. Die-cut sheets; formed wire parts and plastic prop.

AMERICA'S TOP H/L GLIDERS

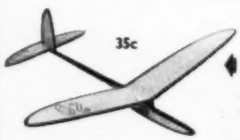
THERMIC DART Die-cut colored surfaces. Span 12"

25c

THERMIC 18

20c

35c



THERMIC 20 Larger version of popular '18' – for contests.

THERMIC B Biggest of the bunch – 55 sq. ins.

50c

The famous THERMIC range also includes 6 built-up type gliders.

THERMIC TRIO

A complete course in basic glider flying. Build all three in a couple of hours. Die-cut parts and easy-to-read plans speed assembly.

1 – FLYING WING

Three Gliders all in one kit 35c

2 – ORTHODOX

3 – TAIL FIRST

Jasco MODELS®

Before you begin to fly your new model, first check carefully for warps. If the plane does not balance at the position indicated, add weight to nose or tail until it does. Check incidence by placing the assembled model on a flat surface and block up under the tail skid until the stabilizer is level. Check by measuring with a ruler from LE and TE down to the base surface. Then check the wing incidence by the same method. The leading edge should exceed the trailing edge by ⅛ to 3/16 in. Continue necessary adjustments until it does that.

The original Blitzen was covered with silk over its entire surface, including the fuselage after the Fibreglass had been applied and sanded smooth. The silk covering over the sheet balsa on the fuselage and rudder add considerable strength and is highly recommended. The model was then finished in Aero Gloss. Give the entire model two or three coats of balsa filler coat before applying the covering. Use plenty of sandpaper for a good finish. Three coats of clear and two of colored were used to complete the job. For an extra-smooth finish, use 320 or 400 Wet-ordry sandpaper before color-doping.

Subsequent models of Blitzen were covered with nylon for greater durability. However, nylon requires many more coats of dope to fill the grain and obtain a first class finish. A little talcum powder added to clear dope, or the use of ready-made filler, speeds up the operation. Paper covering, like heavy grade Silkspan, may be used, but at the sacrifice of some strength.

Flying should prove no problem if the balance and incidence are correct. However, it is best to fly Blitzen at first with a small amount of rudder movement. If you equip your model with a throttle control, improper adjustment on the first few flights might kill the engine. Since the plane is fairly fast, an energetic hand-launch is recommended at first. And remember that Blitzen will be just as dependable as your radio equipment. END

Radio Control News

(*Continued from page* 23)

comes from an RC fan who has submitted many other useful and workable items.

Our last technical item this month is shown in Fig. 3 and indicates how Kelly Day of Wappingers Falls, N.Y. converted his Aristrol 3D receiver to transistor operation of the second stage. The Sylvania 2N94A transistor is of the NPN type and may be purchased for about $5.05. The conventional PNP (lower cost transistors) will *not* work in this circuit. Idling current for the first stage is about .3ma with the relay current in the second stage being about .1ma. A signal triggers the relay current rise to between 2 and 4ma, depending on the resistance of the relay. *Do not* apply 45v to the transistor; better to take 22½v tap from the two 22½v hearing aid batteries which have been connected in series to furnish 45v for the detector.

CLUB NEWS

Here it is early in the New Year and plans are being made for new planes, equipment and contest or sport flying work. **Be sure you send in your FCC registration blank or you'll be sitting on the sidelines at your next contest.** Also, send your comments and suggestions to Dr. Walter A. Good c/o AMA, 1025 Connecticut Ave., N.W., Washington 6, D.C. Walt has done his best to provide all-inclusive regulations to please the majority of fliers. However, to the occasional inevitable gripers all over the country, we say, "As with politics, don't complain if you don't vote."

From Dick Etherington of the Wichita RC Club of Wichita, Kan., comes news of the Wichihawks Annual Model Contest. Despite a 25 mph wind, there were quite a few RC contestants. The flight pattern consisted of take-off, straight flight, procedure turn—and then an attempt (we use the word advisedly) to get back to the field. No one made it back to the transmitter, thanks to the wind. Allen Harmon of Tulsa, Okla. took first place in the Multi-Control Class. Allen used Babcock equipment and a Bonner Compound with motor control. R. E. Etherington of Wichita, Kan. used a Live Wire Trainer with our two-tuber and hand-held 3A4 transmitter to win first place in Rudder-Only. Most heavily represented in both events were the two-tuber (with the transmitter honors being shared by Citizen-Ship), the Mac II and our 3A4 hand-held unit. Bonner escapements were used in almost all installations.

Jim Thrift, 838 Shober Ave., Winston-Salem, N.C. says that the local Jaycees have taken up where Plymouth left off. Other Jaycee groups around the country might be persuaded to entertain this idea also. Jim sends news of the Sixth Annual Winston-Salem FF Meet. With gentle rolling countryside for a flying site, Warren Hall of Burlington, N.C. gathered 132 points to nose out Bob Rector with 126 points in the RC event. The first two winners flew Live Wire Cruisers with Schmidt five-channel equipment. W. W. Barnhardt came in third with 85 points picked up by his Rudderbug and a two-tube receiver used for rudder, elevator and motor control.

This is a good time to repeat that multi-channel is not a cure-all but, once the operator becomes proficient in handling the equipment—watch out! We still believe separate categories should be established for Rudder-Only, Single-Channel and Multi-Channel.

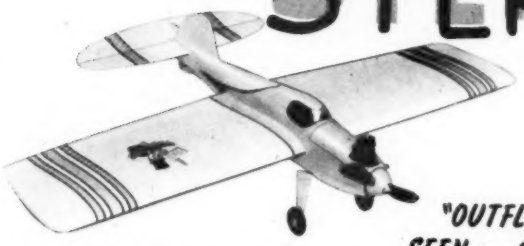
The Down-Under lands of Australia and New Zealand produce some mighty fine RC designers and fliers. Len Brick, 107 Lemon St., New Plymouth, New Zealand dropped us a line on activities of interest in that area. Having come from England, Len is amazed at the modeler's paradise down there. Perfect weather and miles of open countryside. The ED three-channel reed unit is considered tops in the multi-channel field and our two-tuber gets around in almost everything else. Incidentally, the stunt type of flying is being shelved in favor of smooth precision flying. Maybe it really pays off when you consider the endurance records being set down there. Diesels are used almost exclusively.

Bothered by congestion on 27.255? By talk of other high-powered users of this frequency? Then why not use 465? Citizen-Ship long ago proved the usefulness of this frequency and it is surprising that more people don't get hep and use it. At contests, entrants for 465 have an advantage in that, so far, they can fly almost anytime and simultaneously with the 27 jobs. A the Midwestern States Championship held at Stout Field, Indianapolis, the first two places were taken by 465. These two winners used the only 465 on the field.

NEW ITEMS

Just as the gardener looks forward to the new seed catalogues along about now, so does the RC builder scout around for new catologues, parts, equipment and related stuff. Ace Radio Control have their new 1956 RC catalogue ready. Besides the myriad collection of special components and parts, it is profusely illustrated with excellent photographs of a variety of manufactured receivers and transmitters by CG Electronics (Albuquerque, N.M.),

STERLING'S NEWEST MODELS!



SUPER RINGMASTER

Stunt Control Line Model $3.95

Kit S-6—Span 42" for engines from .19 to 60

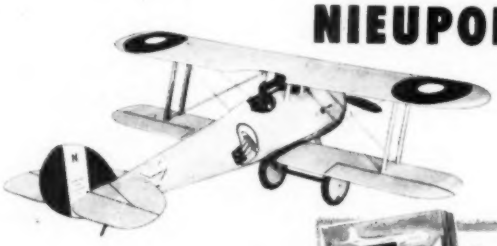
"OUTFLIES ANYTHING I'VE EVER SEEN... AND I'VE SEEN THEM ALL!" says Matt Kania, world-famous model designer.

If you liked the Ringmaster, you'll love the Super! It's Matt Kania's best design. The Super Ringmaster has everything that made the Ringmaster world-famous... PLUS an amazingly simple, rugged, and realistic fuselage. YOU MUST FLY IT to see the astounding difference!

Super Ringmaster features shaped and notched leading and trailing edges. Die-cut ribs, tail surfaces, plywood parts, fuselage. Balsa covering. Formed wire landing gear. Gas model silkspan. Decal insignia. Hardwood motor mounts. Easy instructions, etc.

Captain Eddie Rickenbacker's

NIEUPORT '28'



Kit C-10
—Span 33"
Length 27"

$5.95

Scale Control Line Stunt Model for Class B & C engines

RICKENBACKER'S WORLD WAR I NIEUPORT... AUTHENTIC EVEN DOWN TO THE MACHINE GUNS!

Captain Eddie Rickenbacker, Ace Commander of the famous 94th "Hat in the Ring" Squadron of World War I, scored some of his 25 victories in the Nieuport '28'!

Special features include Custom Spun Aluminum Cowling. Authentic decal insignia. Formed wire landing gear. Easy plans and instructions, etc.

For new catalog, send 10c in coin to cover handling and mailing, to Dept. Man-2

Sterling models
Belfield Ave. and Wister St.
Philadelphia 44, Pa.

Badaco Manufacturing Co. (Shreveport, La.) and others. Kits for practically any receiver or transmitter, the plans for which have been published in various magazines, are also available. Ask for catalogue No. 56-1.

Reed equipment is still winning contests around the country and is increasing in popularity. CG Electronics Corp. should have their new three and five-channel transistorized reed units in kit form by the time this copy reaches the newsstands. Less reeds and relays, the three-channel set will sell for $29.95 and the five-channel for $34.50. We can't praise our unit too highly for it has performed perfectly from the time it was first hooked up until now, having served in a boat and a car for over four months. They also have a five-channel transmitter of advanced design, which features an ultra-stable audio circuit. It is claimed that no more than one setting of tone frequencies is needed. Since this requires factory assembly and adjustment, the unit

(*Continued on page 42*)

Monogram's Cadillac contest winner was Lawrence Apt, South Bend, Ind., here receiving the Coup de Ville from President Jack Besser of Monogram. The $1,000 Saving Bond second prize went to Ronald Rehm, Glen Ellyn, Ill.; third prize, a $500 Bond, to Knute Lawson, St. Petersburg, Fla. Fouth to tenth prizes were each $100 Saving Bonds.

GENIUS at WORK!

He's using *AeroGloss* HOT FUEL PROOF DOPE

Ordinary dope... average cost 15¢ per oz.
Fuel Proofer.... average cost 15¢ per oz.
TOTAL 30¢

AERO GLOSS FUEL PROOF DOPE 20¢ 1 OZ. JAR

You Save 1/3 Cost and Priceless Time!

pactra 'Namel. Non-crazing paint for all plastics. 15¢
pactra 'Namel Kit. 7 colors, brush, C-ment, thinner. 69¢
pactra C-ment. For acetate and styrene plastics. In 1½ oz. long nose applicator tube. 15¢
pactra Hot Fuel Proof Plastic Balsa. Light, strong fillet material . . . . . 30¢

pactra CHEMICAL COMPANY
1213 N. Highland Ave., Los Angeles 38, Calif.

THE
HOLLAND Wasp
LINE

Free Flight... $5.95 U-Control... $5.70

Featuring a Complete Line of
ENGINES...ACCESSORIES...TOOLS...

- Special Wasp Crankshaft
- Wasp Propeller Spinner
- Micro-Tank, Timer and Engine-Mount
- Instant-Action Glow Plug Clip
- Holland Handy Wrench

HOLLAND ENGINEERING CO.
12926 Saticoy Street • North Hollywood, California

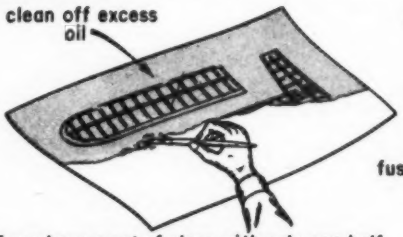
Again Top Winners in the Nationals used GOLD SEAL Fuel to put them in the Winners Circle.

Take a tip from this pair: Gary Grenoble (left) who won the ½ A F.F. Jr. using GOLD SEAL in an Atwood .049 & David Arne, who took first in the A F.F. Jr. using GOLD SEAL in a Cub .09 behind a 7-4 Top Flite prop.

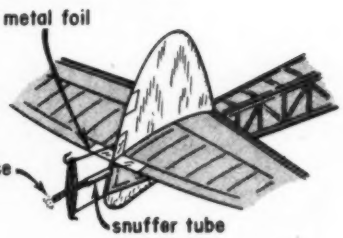
A FUEL
FOR THOSE
WHO WANT
TO WIN

OHLSSON MANUFACTURING CO.
LONG BEACH, CALIF.
Not Connected with Ohlsson & Rice, Inc.

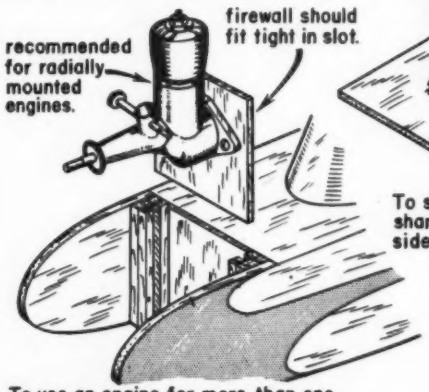
KINKS .... By PAUL E. DEL GATTO



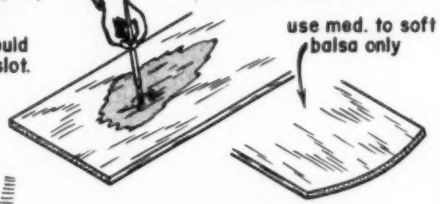
If you have a set of plans with only one half the wing showing and don't want to draw up the other half, just apply some light oil to the back of the drawing in the area of the wing. The oil acts as a transparentizing agent, reproducing the wing plan in reverse.



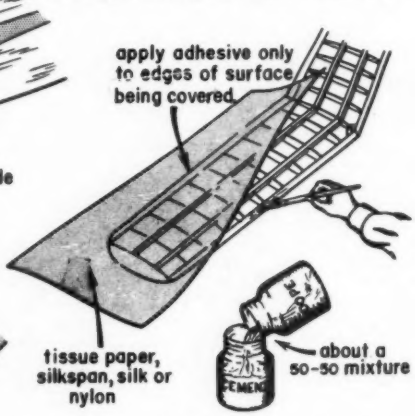
For fuse type dethermalizers, insert fuse in thin aluminum snuffer and use metal foil over trailing edges near fuse.



To use an engine for more than one airplane make it quickly removable by fitting it into a channeled section made with hardwood strips.



To simplify wing sheeting if curve is sharp pre-bend sheeting by doping one side only causing the sheet to curl up.



A simple way of transfering many outline shapes to balsa wood is by pinpointing them thru the plan on to the wood.

A mixture of dope and cement makes a good adhesive for applying covering to model frames.

will be sold, ready-built and adjusted, for $79.95. This will be the T-20.

In addition to their standard five-channel radio, Bramco Products (1717 S. Main St., Pleasant Ridge, Mich.) will make a de luxe custom job called the Gold-Chip for the so-called Country Club Clan, where price is no object. It will have relays with 24-karat gold contacts; reed contacts will also be 24-karat gold. The reeds themselves will be gold filled. Chassis and case are anodized in gold. The rest of the exterior receiver components will be jet black.

Why all the gold? According to Bramco, gold has the lowest resistance of all metals and it has no harmful oxides, which means that relays and reed contacts will not require cleaning.

Last month you read of the German equipment being handled through the Wilshire Model Center, 1326 Wilshire Blvd., Santa Monica, Calif. We received plans for the Electra model which has a span of 51⅛ in., instead of the 55 in. we originally stated. Selling for $2.50, these plans are really super-detailed and come on four large sheets, neatly packaged in a special folder. All pertinent information has been translated into English and all construction materials are standard in this country. Wing area is 403 sq. in., empty weight is 30 oz. and the plane is capable of carrying a 20 oz. payload. Quite an unusual model that would really turn all eyes your way when you arrived at the field with it. What with English and German equipment available for RC work, we'll soon be holding our own Internationals.

Ectron Products Co. (Box 393, Smyrna, Ga.) has a new actuator known as the Multi-Compound, Model E-5. This compact unit sells for $11.95 and features a single starting neutral, does not need a special control box, gives rudder, elevator (both positions) and engine control (electrical contacts). Operating on 3 to 4½v, this unit will supply plenty of power, if you care to use two loops of 3/16 in. rubber. The Multi-Pac battery box, which was described in an earlier issue, has been

THE NEW IMPROVED ESSCO MAC II 5 WATT XMTR

FEATURES

Full legal 5 watt input. High efficiency RF sub-assembly. EASY remove tube sockets. Matched pair 3D6 tubes. Single unit plug-in power supply-charger will recharge BB-54 & NT-6 batteries, will also serve as auto battery trickle charger. ONE MODEL operates on all input voltages, 6 or 12 volt auto battery or from built-in 2 volt cell for away from car use. BIG 4" square multi-purpose meter. This meter is not a toy type but a std. high quality jewel bearing instrument. Meter function switch enables you to read: plate current of XMTR tubes, plate voltage of power supply, charging rate of charger. Low current drain keyer relay eliminates HOT keyer cord. This is a feature that will appeal to those who have had experience with XMTR output changes because of RF in keyer cord. All these features are unique & original with ESSCO. They will enable you to obtain reliable top performance at all times with a minimum of trouble.

MODEL XM-03A Complete & ready for use, only $44.95

MODEL XM-06A Complete for dry battery operation $29.95

MODEL XM-05A Same as XM-06A, in kit form $24.95

SPECIAL SIGNAL CORPS RELEASE

CONTROL BOX BC-1146A, Joy Stick 4 position operation. UP-DOWN-RIGHT-LEFT. Includes DPDT telephone type lever switch and ON-OFF toggle switch. A unique device easily adapted for use with your present multi-channel equipment. Designed for remote control of target drone planes. Can be fastened to belt for easy operation. Alum. case 5 x 5 x 3½ with space for proportional control pulser, etc. Unused, in original govt. packing, only $12.95

FIVE CHANNEL RECEIVER, used with above control box. Includes 5 tuned filter stages, 5 Sigma 4F relays and 7 tubes. Some units available with plug-in 2 tube RF units which can be easily converted to Model Control Channels. Unused, Clean Condition, only 22.95

SPECIAL COMBO DEAL, while they last, Control Box BC-1156A and BC-464A Receiver, both for..... 29.95

THIS IS REALLY A GOOD UNIT

THE ESSCO MINI-PULSER. A reliable miniature size proportional control unit. Housed in handsome completely self-contained case only 2 x 2 x 5. • • • • • • Easily WORTH $25.00, our special low price $17.95

ESSCO R/C FIRST AGAIN! ESSCO R/C

THE IMPROVED ESSCO "LORENZISTOR" ••• A SPECTACULAR NEW GAS TUBE AND TRANSISTOR R/C RECEIVER

ESSCO'S continued research for simplicity in model radio control results in our being able to now offer the most outstanding tube-transistor receiver available today.

FEATURES

Miniature in size—weight—battery drain. A GIANT in reliability—stability—performance—value. Low tube & transistor idle current makes for economical battery & tube life. "A" drain less than 50 ma. Stable 1st stage sensitivity due to use of new model (1956) RK-61 tube & latest type of transistor of FIRST GRADE QUALITY. Hundreds of thousands of these new tiny RAYTHEON transistors have set new standards of performance in service for more than a year. No other producer even approaches ESSCO'S experience in the design & mfr. of TOP QUALITY LORENZ sets or ESSCO'S knowledge gained through large scale usage in every day operation.

MORE FEATURES

Carefully selected newly mfrd. high grade components. Do not confuse the ESSCO "LORENZISTOR" with the surplus stuff offered by other sets using tongue twisting names. Our low price is not based on the use of surplus material but because ESSCO'S established record of being the THE NUMBER ONE R/C SUPPLIER. Our volume sales enables us to purchase first grade materials from the mfrs. at a 25 to 50% savings which is always passed on by us to the Modelers in quality products never approached by others. The ESSCO "LORENZISTOR" uses the exclusive UNI-MOUNT dual sandwich base board Construction. This makes for a sturdy unit easily installed in all models.

MODEL R61LZ, complete set ready for installation, includes **TINI GEM** relay, only $18.95

MODEL K60LZ, complete high quality kit includes all required material, tube, transistor, wound coils, drilled boards & relay, only 14.95

THE NEW ESSCO TWIN DIODE LORENZ RECEIVER

A fully reliable and ultra sensitive set with performance equally as good as our **ESSCO QUAD.** Idle current of 1st stage is a bit higher. For those who want top quality & performance at a lower cost. Features "lay-down" type input coil.

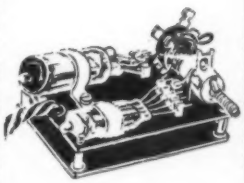
MODEL K-42TQ, complete with H.Q. Kit $10.45

with subminiature control pot & double base 10.95

MODEL R-43TQ, complete set ready for use 14.95

MODEL R-41TQ, complete set with **SIGMA 4F RELAY** 19.95

MODEL CK-TQ, a conversion kit for all model Lorenz and N.A. receivers. Complete with special new subminiature control pot 3.45



THE ESSCO CASCADE QUAD BASIC PARTS KIT includes all required components, drilled base, wound coil National R33 RFC, cable plug-jack, tube clamp & special submin control pot. (less tubes) only $6.95

MODEL K52A QUAD H. Q. parts kit with tubes 12.95

MODEL R43A QUAD, wired & ready for use 16.95

MODEL K50B QUAD H. Q. kit w/ tubes and relay 18.95

MODEL R51B QUAD, wired & ready for use, includes choice of **PRICE ELECTRIC, KURMAN,** or **ADVANCE** relay 23.95

THE ULTIMATE IN RELIABILITY, MODEL R51B SPECIAL with **SIGMA 26F** relay, our most popular set 24.95

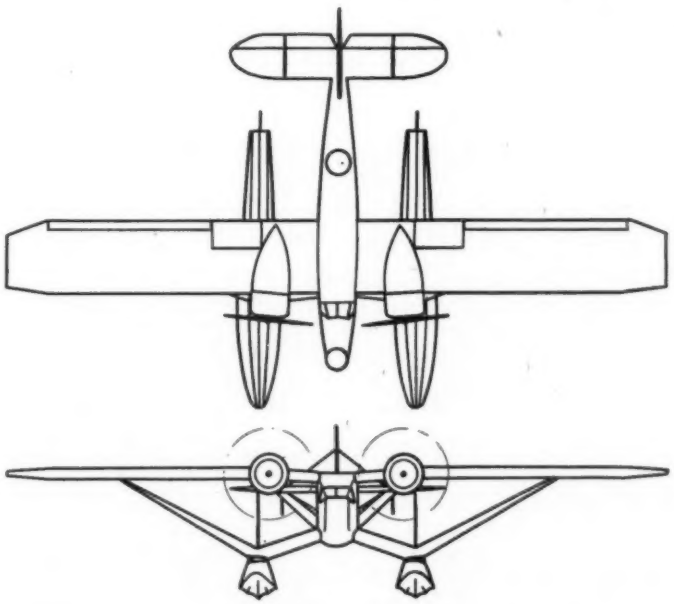
MODEL CK-CQ, a conversion kit for all models & makes Lorenz receivers. Complete with special miniature size control pot 3.95

IMPORTANT NOTE: All ESSCO-LORENZ Receivers come equipped with installation kits, (always extra with others) and NEW 1956 MODEL RAYTHEON RK-61 tube, the old reliable type.

Serving the Entire R/C Field
ESSCO - NEW YORK
58 WALKER STREET
NEW YORK 13, N. Y.

ARE YOU LICENSED?
Send Stamp for Free FCC Form
Check NOV.-DEC. ads listing
Authorized
ESSCO DEALERS

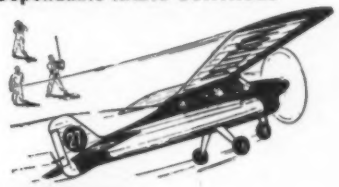
Serving the West
ESSCO - WEST COAST
670 BELL STREET
PALO ALTO, CALIFORNIA



BELLANCA BOMBER

SCALE
0 5 10

Dependable RADIO CONTROLS



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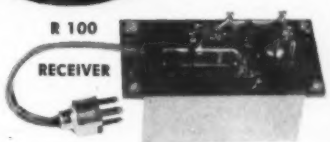

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☐ THE '55 RAMBLER: Moir's top TR. Jan. '56

• • • •

☐ SEVEN-ELEVEN: FF, .19. Dec. '55
☐ GRUMMAN F3F-3: Scale CL. Dec. '55
☐ HI-START: TL glider. Dec. '55

• • • •

☐ EQUALIZER: Multi-control RC. Nov. '55
☐ AMAZOOM: FAI free flight, .15. Nov. '55
☐ QUICKIE TRAINER: Profile speed. Nov. '55

• • • •

☐ T-CRAFT: Big flying scale, .049. Oct. '55
☐ FENO: Combat, stunt, .29's. Oct. '55
☐ PADDY'S WAGON: FF for .049. Oct. '55

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☐ BOOMER: Free flight pusher. July '55
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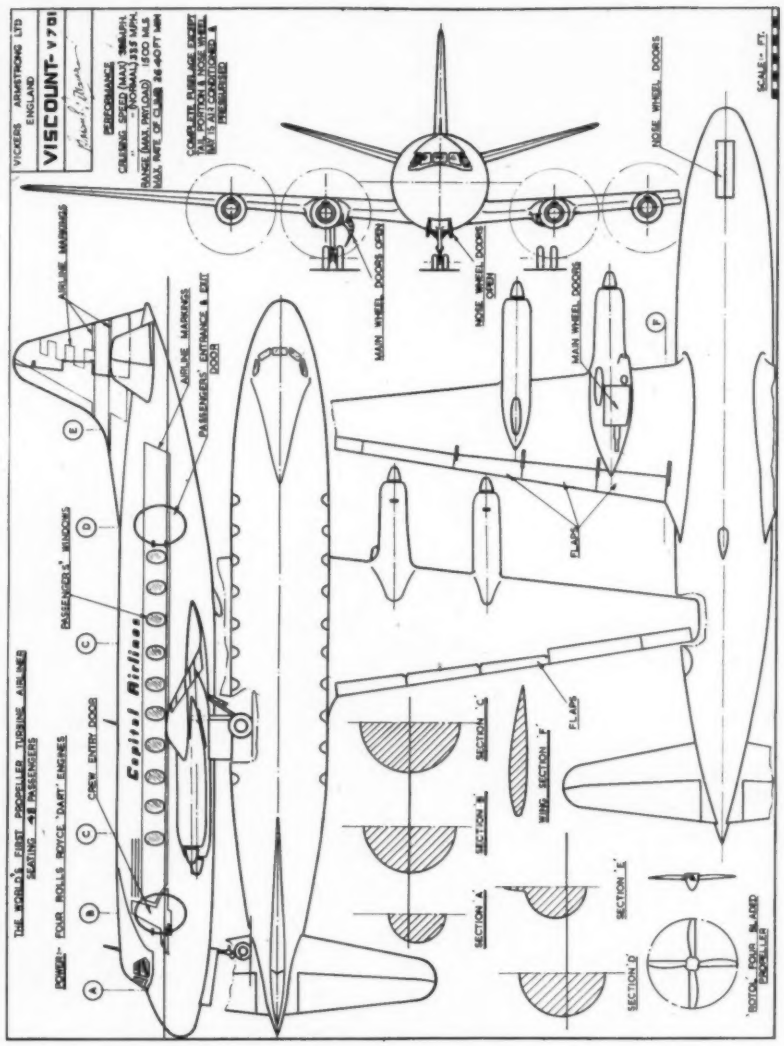

reduced to $1.65. This is the aluminum and fiber battery box which is capable of holding a variety of battery combinations (two 22½v plus six pencells, three 22½v plus four pencells, etc.) A variety of control boxes, capable of providing "memory-free" flying, are also available.

At the time this column is being written, Essco, 58 Walker St., New York 13, N.Y. expects to have these items for early '56 delivery: a remote reading field strength meter to permit flier to do his own transmitter checking; a hand-held Lorenz MOPA transmitter and a transistorized two-tuber based on our original design and modifications. In addition to this equipment for 27mc, Essco will also promote 50-54mc equipment for those who hold the necessary license. This company is to be commended on their role in urging FCC registration on the RC builder and on their refusal to make illegal sales of such equipment to the unlicensed.

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The ABC Robin . . .

(*Continued from page* 20)

used breather holes through the cylinders for the engine. Make these provisions to suit. Use a 7 x 2 prop for testing and check for warps before trying low power test. Increase power for take-off only after all characteristics have been noted.

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Stunt Trainer

(*Continued from page 15*)

There are several points to rememeber when learing to fly stunt. First, when flying maneuvers, avoid the tendency to "haul" a model through the pattern and try to fly it smoothly. Next, when learning to fly inverted, remember that your controls are also reversed: down is up and up is down.

This model is also a good combat design when powered by .19 to .25 engines. Just leave off the landing gear and hand-launch.

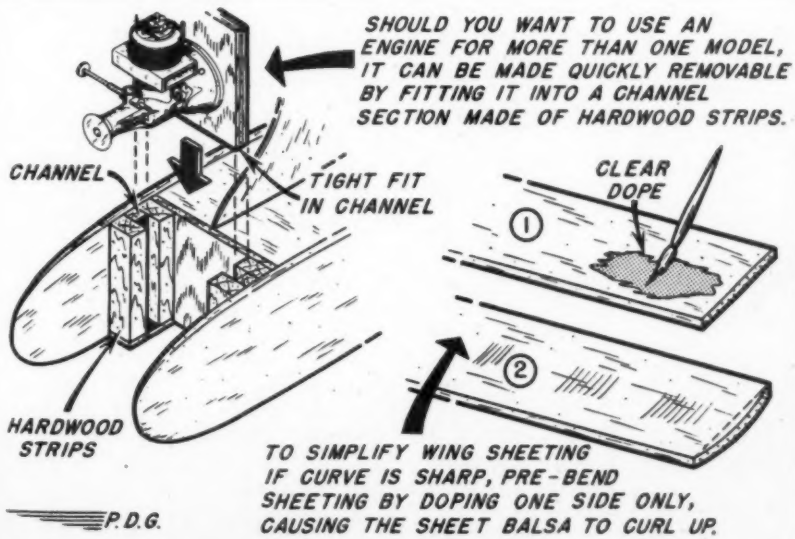
END

Contest Calendar

FEBRUARY

5—*Green Bay, Wis.:* Class AA 2nd Winter Jamboree for FFG, TLG, RC. Robert L. Cowles, Jr., C.D., 224 Oak Hill Dr., Green Bay, Wis. Pending.

19—*Phoenix, Ariz.:* Class AAA Southwestern Regional Model Airplane Contest for FFG, OR, TLG, OHLG, RC, CL, CLS, CLC, FFFS, CLFS, TR. Quentin T. Webster, C.D., 521 E. Camelback, Phoenix, Ariz.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2
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Engine Review

(*Continued from page 36*)

in fuel consumption and more difficult starting, which are undesirable qualities in a team racing engine. A pure speed engine, on the other hand, has only one main requirement: extreme top end performance. Hot timing is essential and, while polishing helps, its benefits are not so noticeable where ports and passages are enormous in the first place.

Reducing fluid friction, gases in the physical sense being fluids, has the effect of raising the torque curve throughout the rpm range, with no change in characteristics other than an all-around improvement in efficiency, efficiency being work produced for fuel consumed.

The cylinder ports of a model engine have two important dimensions, height and width. Multiplied by one another, they give the port area. Port area governs the gas velocity through the port for a given pressure and consequently determines the amount of gas which can pass at that pressure in a given time, or conversely the time required for a given volume of gas at that pressure to pass through the port. Increasing the area speeds up the flow, or allows greater volume to pass at the same speed. Therefore, at a given speed, the greater volume of gas induced and expelled produces higher torque, or at the increased speed made possible by easier gas flow, a higher bhp value. That is, provided there is no bottleneck elsewhere in the engine.

An increase in port area can be effected by an increase in either dimension or both, but since port height in a two-cycle engine also governs port timing and consequently controls the type of performance produced, any alteration to height should be executed with extreme caution. On the other hand, the only two important considerations where an increase in area by increase in width is contemplated are cylinder strength and adequate seal between the adjacent bypass and exhaust ports. If the engine as originally manufactured is generously endowed in these regards, then there is nothing but good to be gained from increasing the port width. This is exactly what George Moir does to the M.S. Fox and, to get the utmost gain, he polishes a radius around the outer edges of both ports.

By considerable experiment he has also found that a slight increase in port height is an all-around advantage; however, since Fox liners have changed from time to time in the course of development, there is no definite figure that applies to all engines. The controlling dimension is the distance from the crown of the piston at bdc to the upper edge of the ports, which he measures on each engine, modifying the port height accordingly. The actual port height, therefore, varies from engine to engine and so cannot be given here. However, on the average, exhaust area is increased by 47 per cent and bypass by 53 per cent.

In recent years the bypass port area and the bypass passage cross-section have steadily grown larger and every increase has, in the case of racing engines, produced a little more urge. Increases in exhaust port area have not produced such marked results and it seems that anything which eases the path of the relatively low pressure charge from the crankcase will show a profit. However, there is a practical limit to the size of a bypass passage, as the gases are not only required to get through at high rpm but also at fairly high velocity at flipping speeds. Large passages are a hindrance to easy starting and, as already mentioned, small passages limit performance. Therefore, a compromise is reached.

Since easy starting is vital to a team racing engine and economical high performance very desirable, the M. S. engines feature an interesting modification for gaining top end performance without hindering startability. The bottom edge of the cylinder liner beneath the bypass port is cut away ⅛ in. up from the bottom. The portion of liner left between this cutaway and the port is ground and polished to form a shallow radius to conform to the path one imagines the gases try to take. As the piston is approaching bdc at the moment at which gas transfer takes place, the piston skirt is also cut away to match the liner. Moir says that he

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tried this modification with some reservation as he expected the piston to distort, but over a considerable time on several engines which he has measured frequently, he has found no increase in ovality or rapid wear, although in the Fox, the by-pass is on the major thrust side of the piston.

If one starts with an engine that has port areas throughout, which balance or suit one another, and then increases the area of the bypass without correspondingly increasing the intake, it is probable that the gain will be very small, since the bypass cannot transfer extra mixture that did not get through the intake into the crankcase. By some very tedious work the M.S. rotary valve port has been enlarged by 28 per cent without any appreciable increase in venturi diameter. The valve port in the crankshaft has been enlarged to match but without any change in valve timing. In other words the extra area has been derived from lengthening the port axially in both cases. To enable the venturi to pass the extra air without any reduction in fuel suction at the spraybar, the venturi has been polished to a high finish and, owing to the port enlargement beneath the spraybar, has, unlike many front rotary intakes, the correct contour for expansion of the mixture after picking up its fuel.

Since the stock crankcase rear cover, because of its projection into the crankcase, to some extent baffles the bypass passage, it has been radiused on one side to help direct mixture toward the bypass from the very bottom of the crankcase and its surface is probably the only easy bit of polishing on the whole engine.

The piston crown and baffle have been brought to a high finish and the baffle thinned and radiused at the edges. The polished combustion chamber has been the object of considerable experiment with regard to compression ratios and fuels. Although under certain circumstances a reduction in compression ratio with the use of heavily nitrated fuels has shown a small gain, it has been found that on the average the stock ratio is the best with the recommended fuel.

Fuels are obviously an important item in the over-all picture of engine performance, but there is no great mystery about them and any talk of a magic brew can invariably be taken with a pinch of salt. However, an engine and fuel must be matched for ultimate performance and a bad engine can never be salvaged by a fuel formula, although an apparently bad fuel can usually be made to give good results by tailoring the engine to suit. People are very inclined to condemn fuels on a poor showing simply because the fuel is not suitable for the particular engine under the prevailing climatic conditions. The M.S. Fox, for instance, apparently gives very high initial power on Supersonic 1000 and then falls off slightly from overheating. A reduction in compression ratio eliminates this fall-off. Fox fuel behaves in a similar manner. Under cool, humid conditions both fuels would probably be quite satisfactory with the stock ratio. George Moir has found that Powermist Infant Thimble Glow with the addition of ¾ oz. of castor oil and 20 cc of Wynne Friction Proof to each pint can is a good fuel compromise with stock compression ratio under normal conditions (*in this particular engine—Editor.*)

With regard to the airborne performance of the M.S. Fox Super .29 Hi-Power, the following should impress. By AAA timing, with the engine in George Moir's New Rambler team racer, 10-mile times of 7.57, 7.59, 7.51 and 7.54 have been put up, including pit stops. In proto speed, in a team racer, an official speed of 106

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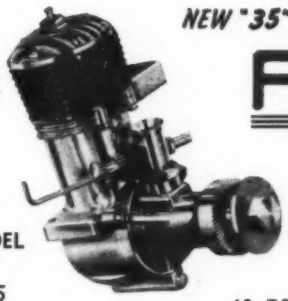

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mph was achieved. Not bad for an economical, easily-starting engine in a large airframe.

In addition to the Hi-Power .29, Model Motors Service also puts out a Fox Hi-Torque .35 which is modified for stunt use.

In concluding this test, we really feel that George Moir has something to offer. He is providing modelers who have neither the time nor facilities for successful improvement of their engines with winning material which, in view of the work involved, can only be described as a gift. Let us hope he finds it practical to apply his talents to engines for other types of competition.

TEST: M.S. Fox Super .29

Plug: OK long-reach, as supplied; Fuel: Supersonic 1000; Running Time Prior to Test: 30 minutes (run-in as received); Bore: .738; Stroke: .700; Weight: 5¾ oz.

Power Prop	*RPM*
9 x 8	13,200
9 x 6	14,250
8 x 8	14,600
8 x 6	15,400
7 x 9	15,300
7 x 8	15,800
Top Flite	
10 x 8	11,100
10 x 6	12,000
9 x 8	12,350
9 x 6	13,250
8 x 8	13,800
8 x 6	14,550

Flap Those Wings

(*Continued from page* 19)

move out until it passes the small drilled hole, which relieves the pressure. If this hole is covered up, the pressure will build up and blow the rubber tubing up like a balloon. This hole should be on the bottom to drain off any oil that might collect in the cylinder.

Webb originally planned to manufacture all the parts ready to install, but he has decided to hold off until he is certain that the flap system will have enough popularity to warrant stocking the local hobby shops with these parts. The actuating cylinders are converted from Hillcrest or, formerly, Comet timers and many dealers may still have them in stock. They can be purchased by mail for $1 postpaid from Model Plastics Products Co., 1695 Cordova St., Los Angeles 7, Calif. If required to do so, this company will mail the timers completely reworked for use as flap actuators. For modelers who don't want to machine their own special gaskets, this company will also build up the complete gasket, needle valve and hypo tube assembly for $3.50 postpaid.

Whippy

(*Continued from page* 10)

and the controlline guide in the center of the wing and tie it to the elevator control horn. Put a drop of cement on the knots.

Cement in the rudder and place 1 in. wheels on the landing gear. A drop of cement or solder on the wire will hold the wheels.

Pin the fuselage together and balance the ship at a point in line with forward loop on the wing tip guide (⅜ in. behind the LE at the center) by adding weights to the nose. When proper balance is obtained, cement the fuselage together and finish with three coats of dope.

The control handle is made from 1 x 2 x 9 in. soft pine. Drill a hole in the end of the handle, near the top, slightly smaller than ⅛ in. in diameter and force-fit a 3 in. piece of ⅛ in. I.D. metal tubing. This tubing acts as a socket for the whip; makes it easy to change whips for long or short lines.

Cut the trigger from ¼ x 1 x 6 in. wood and cut out a finger grip as shown on the plans. Attach the trigger to the handle with a 1 in. screw. Drill a hole in the center of the trigger slightly larger than the screw, so that the trigger works freely. Cut a small notch in the lower end of the trigger and place a rubber band around the notch and over a screw inserted in the end of the handle so that the band holds the lower end of the trigger forward. Tension may be regulated by varing the size or number of rubber strands.

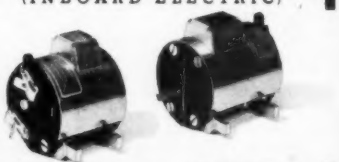
Make the whip from ½ x 4 in. dowel. Insert the dowel into the metal tube in the handle. It must fit tightly. Attach three wire guides to the dowel and run a nylon whip line through the guides and tie it to a screw placed in the top of the handle. Run a controlline through the guides also and tie it securely in a small hole drilled in top of the trigger.

Tie these lines to the leads on your plane so that, when the lines are taut and the trigger is pulled back to a vertical position, the elevator on the plane is held level. Check the operation of the handle and lines by pulling the trigger completely back. This moves the top of the trigger forward and releases the tension on the controlline, allowing the spring to return the elevator to the up position. Releasing the trigger lets the rubber band apply tension to the controlline and depress the elevator.

And so we're ready to fly. Keep the lines short enough, on your first few flights, to prevent the model's hitting the ground simply by raising the whip; 12 ft. lines will suffice. Swing the whip to fly the plane. Whippy flies well at fairly slow speeds, so don't try to swing it too fast. A steady, constant pull on the whip will give you the best flights. If the elevator is hard to work, either lengthen the control horn or weaken the elevator spring by bending down the elevator prong. If the elevator doesn't go into the full up position, strengthen the spring by bending up the prong. After the first few flights, lengthen your lines. The 4 ft. whip will work well with lines up to 18 or 20 ft. Longer lines can be used by substituting a longer whip.

Whippy can be launched with short lines by simply swinging it off the ground with the whip. With 20 ft. lines, grasp both lines 5 or 6 ft. from the wing tip and swing the plane, gradually paying out the lines until you can take over with the whip. Longer lines will require an assistant for launching. Try your first maneuvers on the downwind side of the circle.

BOAT MOTORS
(INBOARD ELECTRIC)



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Begin with climbs and dives and progress into loops, inverted flight, etc. Control the model's speed with the whip. Should the lines ever slacken, the elevator is designed to assume up position. Whippy will stall to the ground without damage.

Bill of Materials

Fuselage: 1 x 2¾ x 12 in. medium balsa block; *wing:* ¼ x 3 x 18 in. medium balsa sheet; *stab* and *elevator:* ¼ x 2½ x 6½ in. hard balsa sheet; *rudder:* ¼ x 3 x 2½ in. hard balsa sheet; *landing gear:* 9 in. of 1/16 in. music wire; *wing tip guides:* 3 in. of 1/32 in. music wire; *miscellaneous:* two small screw eyes, gauze hinges, small coil spring, 1/6 in. wire for tail skid and control horn, wheels, dope, cement, lead weights.

Whip: ⅜ in x 4 ft. dowel; *handle:* 1 x 2 x 9 in. soft pine block; *trigger:* ¼ x 1 x 6 in. pine; *miscellaneous:* 3 in. of ⅛ in. I.D. tubing, wire, screws, rubber band, nylon lines. (The coil spring may be found at a hardware store.) END

All Metal!

(*Continued from page* 17)

head and 1/16 in. round head. Lay out your patterns onto the sheet metal in a manner that will allow you to cut out the pieces without bending them, if at all possible. Remember to drill a small hole in all inside corners, at least 1/16 in. dia, as any inside corner not radiused in this way will crack and may spoil the entire job. If there is a bend at an inside corner, a large hole is necessary to avoid cracking. It is a good idea to use a fine file and remove all burrs and round off all edges on the cut-out pieces.

Should a sharp curve prevent your making a smooth cut, a half-round file will help greatly. When the fuselage sheet has been made ready for bending, pencil-mark the edges of the sheet where the bottom bend is going to be made. Place the object you are going to bend it over on the edge of your bench and slip the sheet under it with the inside up. Aline the pencil marks evenly with the edge of the bench and aline the object you are bending it over with both pencil marks and bench edge. If this object is not very strong, back it up with a block of wood. When you have everything lined up and clamped in place, take a block of wood or similar material at least as long as the bend and, placing it under the sheet overhanging the edge of the bench, bend the entire length at one time. Do not try to bend the metal with a small block in small sections at a time or you will wrinkle the metal and end up with a corrugated surface.

By alining the pencil marks, bench edge and forming piece in this way, any size radius you wish to use will allow the bottom of the fuselage to come out in the same plane or dimension from the center line.

The forward top sections of the fuselage should be formed next by rolling the sheet over tubing, rod or dowel, gradually working down in size until the proper shape emerges. Next, cut the wing and landing gear mounting brackets from angle, one thick leg and one thin leg, if obtainable, or cut and bend the angle from at least .030 in. thick sheet aluminum and rivet thicker pieces onto it, if necessary, so that you can tap screw holes into it. Remember your landing strains will be on these pieces so do not try to get by with too light material. Rivets holding these pieces to the sheet skin should be about ½ in. apart.

The best joint with flush-head countersunk rivets on these parts results from countersinking the thicker brackets and dimpling the sheet skin into them. Take

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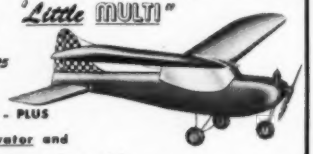

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some scrap pieces of the same materials and practice doing this type of riveting before trying it on the fuselage. First, drill your No. 50 hole in the heavy bracket piece, then countersink deeper than you have been doing on the wings and tail. This allows for the thickness of the sheet skin. Drill a No. 53 hole in the skin and place it over the hole in the thicker piece you have countersunk. Grind a center punch the same angle as the countersunk bit and, placing the point into the No. 53 hole, tap with your hammer until the skin drops tightly into the countersunk hole. This should have enlarged the No. 53 hole to a No. 50 hole; if not, drill it out to No. 50.

Place a rivet in the hole: if it is even with the outside skin, you've done a good job; if it is too low, the hole was too deep. If it sticks up above the skin, the hole was too shallow or the skin has not been tightly packed. After you have practiced enough to do a good job, place the brackets in their proper positions on the fuselage and drill all the holes needed with a No. 53 drill through both bracket and skin. Remove the bracket and redrill it with a No. 50 drill and countersink all holes. Replace the bracket in position on the fuselage and center-punch and rivet as you did in practicing on the scrap. If you have been careful, you should have a good strong support for your wing and landing gear.

The projecting part of the fuselage skin below the landing gear bracket can now be bent around the brackets. The engine mounts should be made from aluminum angle that is from 3/32 to 1/8 in. thick and 1/2 in. wide on the legs. They should extend from the front of the fuselage back past the landing gear brackets and are best screwed to the sheet sides, as rivets will loosen quickly in engine mounts unless they are of a wide surface type and riveted in the manner that you used on the wing and landing gear brackets. Otherwise, you will have to put screws in anyway after the first few flights. I used just three screws in each mount on my models one about 1/2 in. from each end and one in the center of each mount.

Cut the motor mounts to length and check to see if any radius must be filed in the side that bolts to the sheet skin. If so, file to shape, then clamp to the sheet on the center line which can be located with your fuselage pattern. When this has been tightly clamped in place, drill the three holes, tap drill size, through both skin and mounts and tap both pieces with 4-40 tap. Remove the clamps and locate the position of your engine and tank on the mounts. Cut out those sections of the horizontal leg of the mounts that are ahead of the engine and behind the tank but leave about 1/2 in. at the back end to be used to bolt a stiffener panel in place between the engine mounts and wing brackets. The stiffener panel is necessary on low-wing models to stand pull test strains.

You are now ready to bend the back of the fuselage. On a stick about 1 1/2 in. sq. and 3 ft. long, taper one end equally on opposite sides down to 1/8 in. thickness with the taper about 16 in. long. File and sand a radius along the top of the taper with the diameter equal to the width of the taper along the entire length. Now clamp the square end of the stick in a vise so that it projects out horizontally with the rounded part of the taper up. If your model has curved sides, draw the fuselage sheet back and forth over the tapered stick or edge of your bench until it has the desired curve, as you did with wings and tail. Then, centering the sheet on the tapered stick, work into shape with your hands or a couple of flat sticks. Don't

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hurry this process as you can go too far before realizing it. Now clamp the bottom of the fuselage together, overlapping the sheets, and measure the wing opening and tail to assure correect width. Then space rivet holes ¾ to 1 in. apart. Incidentally, a better joint is possible by trimming the sheets to allow butting them together, with a narrow strip inside riveted to each sheet. While some of the rivets near the wing opening can be reached from inside, those near the tail are out of range and therefore I use round-head rivets there, put through from inside with a bucking bar of steel ¼ x 1¼ x 12 in. long held in the vise and slipped through the tail slot. Try to get someone to hold pieces in place while you rivet.

Stabilizer slots can be bent with a pair of long, thin jaw pliers or a piece of wood clamped along the point of bend, working the metal with a dowel or metal rod. Make the bend half the thickness of the stabilizer plus the thickness of the metal from each side of the cut.

Cut a strip of .020 or .030 aluminum sheet ½ in. wide and the length of the upper cowling. Butt the two sides together with the strip clamped inside. You will probably have to curve the strip to the proper contour by laying it on a piece of steel tube or a hard dowel and working it curved with a rubber or leather mallet. With the strip clamped in place, check the alinement of the fuselage, shifting the sides on the strip, if necessary, and then rivet the pieces together. Check the butt-joint as you go along to make sure it remains tight. Cut the landing gear from at least .050 24 ST aluminum and bend with at least .150 in. radius to prevent cracking. You may wish to streamline the landing gear legs with a file.

Drop the wing into place on the fuselage and check for spots that may need to be filed for a better fit. With the wing properly alined, clamp the landing gear in place on the brackets, making sure it is square with the center line. Drill four tap size holes through both landing gear and brackets, two on each side. Remove the landing gear and redrill it to screw size, using at least 4-40 screws. Tap the brackets and rescrew the landing gear in place. Check the wing for alinement and mark the mounting holes for position, if possible drilling them now. Remove the landing gear and wing and tap the wing brackets to screw size, drilling out the holes in the wing to clearance size. Screw the wing and landing gear back in position and add the engine mounts, which should be checked at the nose for correct width. Place engine in position. Note that the mounts may have to be filed at an angle to allow the crankcase to slip through. When the engine is properly alined, mark the hole positions for the mounting screws, then remove engine, drill holes tap size and tap. When the engine has been installed with screws and lock washers, solder angle brackets of heavy brass or tin to your tank to leave it as close to the engine as possible when it is attached to the engine mounts.

Now remove the wing from the fuselage. (You will probably have to remove the landing gear to do so, but note that it must be in place for the next step.) Cut and bend a piece of sheet aluminum to fit inside the fuselage to be bolted to the flanges you left on the back of the engine mounts, bend over the front wing mount with holes drilled to match the wing mount screws. Cut a section from the center to clear the control horn. This is the stiffner panel. Drill tap and screw the panel to the engine mounts and replace the wing. Slip the stabilizer into the slot in the fuselage and locate the position of the mounting screws in the top of the

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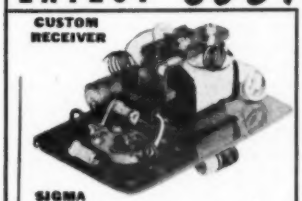

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fuselage. Drill clearance holes for the screws and insert rear screw. Cut a piece of metal tubing to fit between the top of the stabilizer and the top of the fuselage at the front screw. The tubing should fit snugly over the screw to avoid buckling the fuselage.

There are two methods to hold the front of the vertical fin or rudder in place: one is to cut an L-shaped block or angle that fits under the head of the stabilizer screw, which is threaded into the stabilizer and with two small screws through the sides of the rudder fin into the vertical part of the angle; the other is to slip the screw up through the stabilizer into a threaded block riveted inside the rudder fin, which requires a hole drilled into the bottom of the fuselage below the stabilizer screw to admit a screwdriver blade.

The bottom of the rudder is slipped inside the rear fuselage opening and a tap hole is drilled through the bottom of the fuselage into the block that is riveted in the bottom of the rudder. Remove the rudder and tap the hole for the screw. Measure the distance from the pushrod, extending from the control horn back into the fuselage to the hole in the elevator horn. Cut a bicycle spoke just short of this distance and slip it through the elevator horn. Now solder a spoke-nipple or nut onto the spoke so that it can be screwed onto the threaded spoke inside the fuselage. By removing the elevator horn from the elevators, you can change the adjustment on the elevators to the correct up and down limits by screwing the pushrod on or off. Bend a tailskid to slip over the bottom rudder screw and into a hole in the bottom of the fuselage so that it can be easily replaced.

Install a fuel shut-off now if you are building your model for team racing. Fit the lower engine cowling in place and check for favorable screw positions. Drill screw holes tap size, 2-56 being large enough for this, two on each side. Rivet the cowling together below the spinner location and screw into place after making holes for exhaust, plug and needle valve.

Bolt a good pair of at least 2 in. soft rubber wheels on the landing gear and point them slightly to the right so that the model will roll away from the center of the circle. Install the prop and spinner, but first you'll have to do a little experimenting to find the right prop for your engine.

If you are going to paint your model, do so before you even run the engine in the model. Any fuel or oil that gets into cracks or under rivets before painting will spoil the paint job. Disassemble the model for painting: remove the wings, tail, cowling, landing gear and engine, because you'll get a superior result by painting each part separately. Start by spraying a

ADVT. INDEX, FEBRUARY, 1956

American Telasco 47
America's Hobby Center 5, 6, 7
Babcock Radio Engineering 36
Berkeley Models 54, 55, 56
Bonner Specialties 50
Cheminol Corp. 1
Cleveland Models 52
Cobb Hobby 50
Comet Model Hobbycraft 37
Craft, Model & Hobby Industry 48, 50
DeBolt Model Engineering 46
Deltron Co. 43
Dynamic Products 48, 52
Ectron Products 37
Electronic Specialty Supply 43
Forster Brothers 47
Fox Mfg. Co. 48
Francisco Laboratories 45
Gull Model Airplane Co. 35, 53
Henry Engineering 33
Herkimer Tool & Model Works 3
Holland Enginnering 42
Jasco Models 40
K & B Allyn Co. ..... 3rd cover
Lindberg Products ..... 2nd cover
Matthew Day Co. 50
McCoy Products ..... 4th cover
Medley Mfg. Co. 45
Minnesota Engine Works 52
Model Aircraft Co. 46
Model Trains 49
Moen Trading Co. 51
Monogram Models 8
Newx Products 50
Ohlsson Mfg. Co. 42
Pactra Chemical Co. 41
Pittman Electrical Developments 48
Radiomodels 50, 51
Scientific Mfg. Co. 38, 39
Sig Mfg. Co. 46
Spitfire Products 49
Sterling Models 41
Testor Chemical Co. 28, 29
Topflite Models 35
Wilshire Model Center 53
World Engines 34

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ARE YOU REALLY GOING TO ATTEMPT "THE 4 LEAF CLOVER" TODAY?
YOU'LL NEVER DO IT
WHAT! WHY I WAS FLYING STUNT WHEN YOU THOUGHT IT WAS SUMPIN COFFEE WOULD DO TO YOUR GROWTH...
YOU'LL NEVER DO IT
LADIES & GENTLEMEN I'VE JUST RECEIVED WORD THAT MR. CONNROD WILL ATTEMPT A STUNT PATTERN NEVER BEFORE FLOWN "THE 4 LEAF CLOVER"!
NEXT TIME - LEAVE OFF THE STEM
WIN $5.00! SEND IN AN ACCEPTABLE IDEA FOR A CONRAD CARTOON.

coat of zinc-chromate yellow metal primer. When dry, sand lightly with 400 Wetordry paper to remove fuzz or bumps, but don't sand down to the metal. I use synthetic enamel, allowing it to dry for a day or two before applying trim or decals. For complete feulproof results, allow to dry for 10 days to two weeks.

CG should be 15 to 20 per cent of the average wing chord behind the LE. Always take off with the elevators in neutral or a slight up position but never in full up. A stall on take-off can be disastrous. Don't try any steep dives and low pull-outs until you are thoroughly familiar with the flying characteristics of the model. When landing, remember to keep the nose down enough to prevent stalling. This model will probably land faster than you have been used to and the normal reaction is to flair out too soon. A wheel landing is one of the prettiest sights you will find in controlline flying. END

MAN at Work

(*Continued from page 6*)

of adult modelers is increasing rapidly, especially among professional men, such as doctors, lawyers, dentists, engineers. Know another reason. Lots of mail to this column from old timers who have been out of the hobby for years. Usually, Junior is the excuse . . . Can't fathom RC'ers grumping about 27. What's the matter with 465? Have had many fine flights on 465. No waiting in line; fly anytime!

AMA has a wow of a new insurance policy for members. Old policy covered you during contests. Now coverage is for all the time. You enjoy this coverage automatically as a benefit of AMA membership. Models do have to be flown in accordance with AMA regulations and *Fly Safely* specifications . . . Hamilton Aero Club (Mike Cook, 25 E. Fountain Ave., Glendale, Ohio) looking for members. Inter-club correspondence, regarding meets, etc., welcome . . . Interested in free flight? Don Alberts, Senior National Champion, makes sizzling rebuttal to our contention (10/55 MAN at Work) that free flight is in a rut. No holds barred. See you next month?

Foreign Notes

(*Continued from page 34*)

bearing Diesel featuring Oliver-type porting and was designed by George Fletcher. Output is around .26 bhp at 14-15,000 rpm. Unlike most Diesels, starting is outstandingly good on small props and the motor is notably economical. Should be good for team racing. Unusual feature is the front bearing which is entirely enclosed in a synthetic rubber oil seal, thus effectively excluding dirt from bearings as well as keeping them well lubricated.

Brazil: Club Activity

Curtis C. Goodson of Sao Paulo has sent us some pictures showing model activities in Brazil, including one showing a very nice workshop used by the Campinas Model Club. Occasion was a get-together of modelers from the cities of Campinas and Sao Paulo. We note that controlline jobs seem to be popular, with scale and team racing well to the fore.

Czechoslovakia: New World Record?

We hear (as yet unconfirmed) that Jaroslav Koci, noted Czech speed flier who cooperated with Josef Sladky in recent outstanding Czech performances in FAI Class I speed, has set a new mark of 203.533 km/hr (126.47 mph). If true, this exceeds the present Italian-held record by more than 8 mph. This is certainly a pretty sensational performance for a .15 cu. in. motor. END

Taifun-BAMBY

Wingspan: 50½ in.
Length: 31
Weight: 7.6 ozs.

$4.50
C.O.D.
or at your dealers

MADE IN WESTERN GERMANY

Plans only $1.00

BAMBY Towline Glider, FAI Class A-1. Designed by the noted Yugoslavian sailplane designer, Janez, now residing in Germany. A Pop-Up D/T is incorporated for competition flying and also an ingenious auto-rudder arrangement for circling, thermal-hunting flight. A maximum wing area was chosen, stabilizer area was kept low. For thermal riding, a long tail moment arm has been used, plus a fairly large wingspan, the wing being of high aspect ratio. The construction of this model glider is in no way difficult, the kit is prefabricated and the plans are in English and very complete. Order your BAMBY today.

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WILSHIRE MODEL CENTER
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(See the 40 tube Monster Receiver)
PRICE $3.98 ☐

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For Free-Flight Gas — Controline — Rubber Power

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.035 to .049 Engines—35" Wingspan .049 to .099 Engines for Controline

Completely re-designed to match its Nationals winning record with "½ A" engines, modern pre-fabrication and simplified sheet balsa construction techniques. This design will soar to honors in the contest season ahead!

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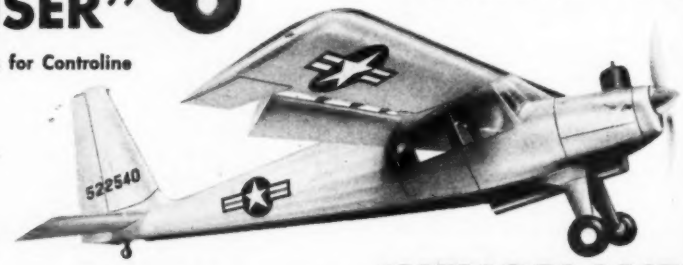
This is the current version of the "Interstate Cadet," many time National's winner. Authentically detailed and structurally re-designed for "½ A" free-flight. Full Size Plans show rubber, controline adaptations, etc.



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Cessna's newest light plane, reproduced authentically and in detail. Perfect proportions for free-flight. Full Size Detailed Plans show rubber and controline adaptations. Pre-fabricated construction, Decals, etc.

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1" Scale—Free-Flight, Rubber or Controline
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Variable Camber Wing for Two-Speed Radio Control Flying

For .049 to .14 Engines — 39" Wingspan — 1" Scale

The "Helioplane" is the first model that permits the use of scale wing flaps. Depress 10 degrees for free flight; 25 degrees for slow speed control by radio; or raise wing flaps 5 degrees for high speed flight!

Radio Control
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For Free-Flight Gas — Controline — Rubber Power

Cessna L-19

"BIRD DOG"

.035 to .049 Engines for Free-Flight
.049 to .099 Engines for Controline

In active duty in Korea, this new liaison plane is perfect in proportions for model work. Plans show it as a free-flight "½ A" gas, with details for rubber and controline conversion. Authentic decals, die-cut balsa, plywood and celluloid; shaped and notched wing edges; formed gear, etc.

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STINSON SENTINEL "L-5"

33½" Wingspan

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Equipped with wing slots, this authentically detailed model flys with the best. Designs in this series have been chosen for performance.

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Featured as a landplane, plans show pontoon details for those desiring the added thrill of water take-offs. Finished model is really spectacular.

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This low-wing sport plane turns in long stable flights. The tricycle landing gear adds realism to landings.

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For .15 to .25 Engines—71" Span—2" Scale

Weight: 4½ lbs. — 700 Sq. In. Wing Area — 14.2 oz. Loading

The "Piper Cub J-3" needs no introduction. Most famous of all light aircraft, it's a natural for R.C. or Free-Flight flying. The six foot span permits the extra R.C. installation that you dream about. This is a rugged, detailed, flight proven design. Full-Size Plan with R.C. installations, Authentic Decals, etc.

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Controlling your "Cessna 170" by Radio is a thrill you will not forget! Perfect in scale, rugged, stable in all attitudes, yet responsive in control, with good wind penetration qualities. The gear location is ideal for extended take-off runs. The larger than average size makes it easier to control in windy weather.

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Radio Control - Free-Flight - Controline

Piper "TRI-PACER"

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This perfect scale R.C. design may be built as a Free-Flight or Controline version if desired. Full Size Plans cover special details for all three versions. Flaps, elevator, rudder, motor and nose gear may be operated by R.C. Ailerons for trim, cabin door access to Radio. Highly Pre-fabricated, Authentic Decals.

1½" - 1' Scale—44" Wingspan

.065 to .099 Engines—Radio Control

.035 to .075 Engines—Free-Flight

.075 to .15 Engines—Controline

"GIANT" FLYING SCALE

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NAVION "Super 260"

- **Full Size Plans with Radio Control Details**

This beautiful scale replica of the famous "Navion" is a fast, rugged and truly different R.C. or Free Flight design, easily adapted to Controline Flying. Thrill to its flashing performance and smooth response. As a free-flight, it will give you experience and confidence in low wing designs. Big, roomy, and well engineered, it will set the pace whenever it's flown. Easy to build!

For .29 to .35 Engines Radio Control

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- **Molded and Embossed Celluloid Canopy**
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Tone Control on 27.225 mc. (Examination Free)
Easy to adjust, dependable, trouble free operation.

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$49.95

A High-Low Power Output control switch gives range control. Pilot light positively indicates operation. Metal carrying case with handle measures 8" x 10" x 10", weighs 15½ pounds. Comes complete with Crystal and Whip Antenna. (Less Batteries)

Three years of exhaustive field testing by Doctor Good and Joe Dale have made it possible to produce the finest Radio Control equipment on the market, regardless of price. Place your order with your local dealer today, and be assured of immediate delivery.

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27.225 mc.
4¼ oz. 2⅝" x 2⅝" x 3"

"TONE-AEROTROL" RECEIVER

Low battery drain. Three tubes operate for long periods without any adjustment. Receiver complete with a 5000 Ohm relay

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Receiver is not apt to pick up R.F. Carrier from wrong transmitter as signal must be modulated at audio frequency. Perfect for R.C. Novice flyers.

Crystal Controlled Dual Conv. Tuned

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27 mc. "SUPER AEROTROL"

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Combination "Super Aerotrol" TRANSMITTER-RECEIVER Kit (less tubes)	**$29.95**
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Kits may be assembled in less than two hours. No radio experience necessary. Step-by-step plans, color coded wiring. Just solder and screw together. Chassis and all electrical components are included.

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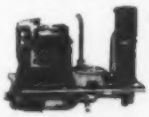

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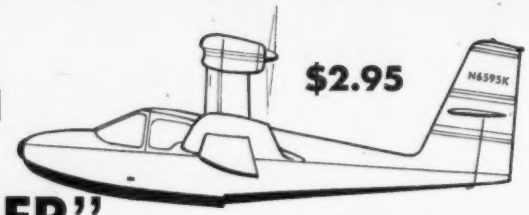
A GREAT NEW "½A" SCALE CHAMPION



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COLONIAL "SKIMMER"

For Free-Flight — Controline — or Rubber Power!

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For .19 to .35 Engines—45" Wingspan

Featuring: METAL COWL — FLYING TIGER DECALS - STUNT FLAPS

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Authentic and complete down to both Army and Navy decals, the AT-6 is one of the most popular kits of all time. Performance is excellent.

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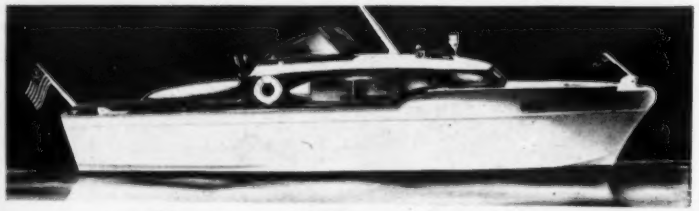

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27" Wingspan

Controline

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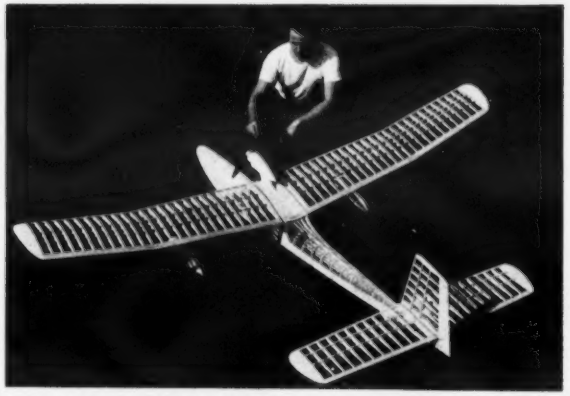
For two .045 to .099 Engines plus Jetex 100, 200 or Jetmaster 150 unit, for exact scale power.



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1440 Sq. In. Wing Area

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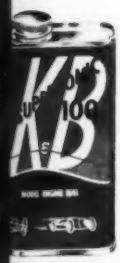

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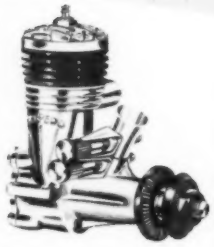

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Also available in
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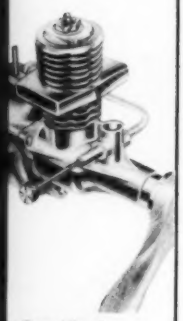
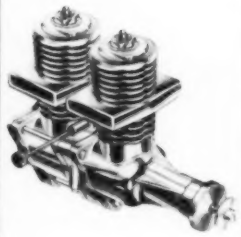


y Fury Single
.049 - $4.95



Sky Fury Twin
.099 - $9.95
.15 - $11.95

ury Outboard Twin
14.95 .15 - $16.95
available in Single
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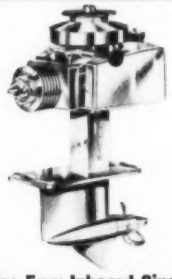

Sea Fury Inboard Single
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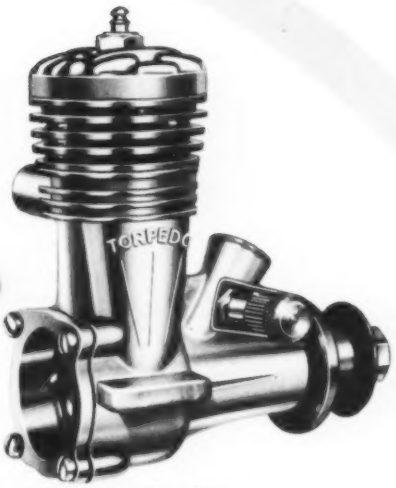
Also available in Twin
.12 - $14.95 .15 - $16.95

F.A.I. RECORD HOLDER *the* TORPEDO .29R

$15.95



Yes, the new Torpedo .29R racing engine is already a "Star Performer." One of the prototype models of the Torpedo .29R was entered in the F.A.I. Speed Trials, by Bill Wisniewski, the popular speed flyer from Lakewood, California. He established, and now holds, the International Speed Record of 142.2 M.P.H. The Torpedo .29R follows the same basic design as the world famous Torpedo .15, .19, .23, and .35.

This new Torpedo .29R is particularly adaptable to Team Racing, U Control Speed and Combat Flying. It is in addition to our present Torpedo .29 green head model that has been so popular for the past nine years. The Torpedo .29R has the same mounting dimensions as the Torpedo .35.

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STREAMLINE WHEELS • SLIP ON CONNECTORS • GLOW PLUGS • SHUR STOPS
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McCOY Super Stunt

engines give guaranteed Full Power, Easy Starts!

McCOY SUPER STUNTS
"9"—$7.95 "29"—$11.95
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"Micro-Five" slug pistons—"McCoy's *Military Secret*"—in McCoy Super Stunt engines are machined and microfinished to tolerances of 5 millionths of an inch—in both concentricity and size. This assures perfect fit of every McCoy piston and sleeve, interchangeability of parts, and minimum break-in. New fuel flow system gives 17-inch fuel draw for smooth, even running during stunt or combat maneuvers.

It's here! The new McCoy *Super Stunt "19"* is at your dealer's . . . ready to fly. And inside this engine is the "Micro-Five" slug piston proven so successful in the larger *"29"* and *"36" Super Stunts.*

Microfinished to extremely close tolerance, the "Micro-Five" piston assures easy starts and long fuel draw. These *Super Stunts* run like jack rabbits with their new pistons; and they feature famous McCoy power, ruggedness and dependability for stunt, free flight, combat and team racing. See the *Super Stunts* perform on the flying field. Then ask your dealer to show you the new McCoy *Super Stunt "19"* with "Micro-Five" slug piston.

You're flying high when it's McCoy powered!

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If you fly in the ½A class, you're ready for a larger engine . . . make it a McCoy Super Stunt. And if you want to fly ½A, you'll get the same easy starting, dependability and traditional McCoy power in the sensational new McCoy .049 Glo engine.

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McCoy Diesels
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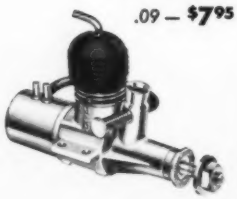
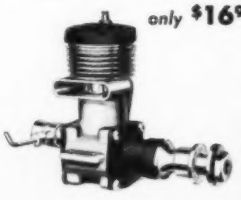
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